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WEST VIRGINIA UNIVERSITY

1974-75 Undergraduate Catalog

A modern rapid transit system under construction will connect WVU's Morgantown campuses. The internationally unique system will consist of a 9.4-mile guideway and about 100 cars that will have a peak capacity of 1,100 people in 20 minutes. Above is the Engineering Station on Evansdale Campus; below left is the Downtown Campus Station. The system is being financed largely by the U.S. Department of Transportation as a research and demonstration project.

WEST VIRGINIA UNIVERSITY

1974-75 Undergraduate Catalog

COVER: Moore Hall, Downtown Campus.

1974

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UNIVERSITY CALENDAR, 1974-75

1974 First Semester

May 18, Saturday ..... Alumni Day
May 19, Sunday ..... Commencement
June 10, Monday ..... Registration for Summer Session
June 11, Tuesday ..... First Classes, Summer Term
July 4, Thursday ..... Independence Day Recess
August 10, Saturday ..... Close of Summer Term
August 25, Sunday, to August 27, Tuesday, incl. ..... Freshman Orientation
August 26, Monday ..... General Registration, First Semester
August 27, Tuesday ..... General and Freshman Registration
August 28, Wednesday ..... First Classes, First Semester
September 2, Monday ..... Labor Day Recess
October 8, Tuesday ..... Faculty Assembly Meeting
October 18, Friday ..... Mid-Semester
October 24, Thursday ..... Mid-Semester Reports Due
November 27, Wednesday, to
December 1, Sunday, incl. ..... Thanksgiving Recess
December 13, Friday ..... Last Classes, First Semester
December 16, Monday, to
December 21, Saturday, incl. ..... Final Examinations, First Semester
December 22, Sunday, to January 5, Sunday, incl. ..... Christmas Recess

1975 Second Semester

January 6 and 7,
Monday and Tuesday ..... General Registration, Second Semester
January 8, Wednesday ..... First Classes, Second Semester
February 7, Friday ..... West Virginia University Day (not a holiday)
February 17, Monday ..... Washington's Birthday Recess
March 1, Saturday, to
March 9, Sunday, incl. ..... Spring Recess
March 10, Monday ..... Mid-Semester
March 17, Monday ..... Mid-Semester Reports Due
March 31, Monday ..... Easter Recess
April 8, Tuesday ..... Faculty Assembly Meeting
May 2, Friday ..... Last Classes, Second Semester
May 5, Monday, to
May 10, Saturday, incl. ..... Final Examinations, Second Semester
May 12, Monday ..... Grade Reports for Graduating Seniors and Graduate Students Due in Deans' Offices
May 13, Tuesday ..... Deans' Reports of Graduates Due in Office of Admissions and Records
May 17, Saturday ..... Alumni Day
May 18, Sunday ..... Commencement

The academic year is divided into two semesters of approximately seventeen weeks each and a summer session of nine weeks.

It is the policy of West Virginia University to provide equal opportunities to all prospective and current members of the student body, faculty, and staff on the basis of individual qualifications and merit without regard to race, sex, religion, age, or national origin.

The University also neither affiliates with nor grants recognition to any individual, group, or organization having policies that discriminate on the basis of race, sex, religion, age, or national origin.

WEST VIRGINIA BOARD OF REGENTS

1316 Charleston National Plaza

Charleston, WV 25301

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Morgantown, WV 26506

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West Virginia University Bulletin
Series 74, No. 8-2, February, 1974
Issued Monday, Wednesday, and Friday
Second-class postage paid at Morgantown, WV 26506

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CORRESPONDENCE

Address as follows:

Admissions, Catalogs, Records
Dean of Admissions and Records

Graduate Programs
Dean of Graduate School

Housing
Director of Housing

Loans, Scholarships, Work-Study
Financial Aids Office

Off-Campus Programs
Provost for Off-Campus Education

Potomac State College
Executive Dean
Keyser, WV 26726

Research
Provost for Research and Graduate Studies

Student Life
Dean of Student Educational Services

Undergraduate Programs
Provost for Instruction

Veterans Affairs
Financial Aids Office

Matters of General University Concern
The President

West Virginia University
Morgantown, WV 26506

WEST VIRGINIA UNIVERSITY

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Provost — Health Sciences, Charles E. Andrews, M.D.
Provost — Instruction, Jay Barton, II, Ph.D.
Provost — Off-Campus Education, Ralph E. Nelson, Ph.D.
Provost — Planning, Raymond M. Haas, D.B.A.
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Assistant to the President — Rapid Transit System, Samy E. G. Elias, Ph.D.
Administrative Assistant, Mary A. McDaniel, M.A.
Administrative Assistant, Wilma G. Starkey
Executive Secretary to the President, Edith I. Kelley
Internal Auditor, S. A. Cunningham, B.S., C.P.A.
Ombudsman, Stacy L. Groscup, M.Div.

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  International Programs, Newton M. Baughman, Ph.D., Director
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  Coal Research Bureau, Joseph W. Leonard, M.S., Director
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Housing, Robert A. Robards, B.S.
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Physical Plant, Vergil B. Clark, M.S.
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Security, Kenneth B. Johnson
University Hospital, Eugene L. Staples, M.H.A.
Nursing Service, Audrey E. Windemuth, M.N.A.
University Relations, Harry W. Ernst, M.S.J.
Publications, John Luchok, B.S.J., University Editor

West Virginia University is a member of the North Central Association of Colleges and Secondary Schools. All of the University's educational programs are fully accredited by the North Central Association and by the appropriate accreditation agencies for the professional schools.

Part 1

GENERAL INFORMATION

Opportunity is what West Virginia University is all about . . . opportunity for people to realize their potential regardless of family income, race, religion, age, sex, or national origin. Through the educational and cultural opportunities it provides, WVU helps people to find satisfying careers as well as to better understand life and themselves.

This is the unique land-grant tradition to which WVU belongs . . . one of only 71 such institutions serving the nation, which have been described as "people's universities for people's problems." They are called land-grant institutions because the Congressional act establishing them in 1862 gave federally-owned land to each state that then sold the land and used the funds to begin a college which offered programs in agriculture and engineering.

Since its founding in 1867, WVU has developed into a comprehensive university, offering 88 majors in 16 schools and colleges, and it has become the center of graduate and professional education, research, and extension programs in West Virginia. It is this intellectual variety and mix that makes WVU an exciting institution with an abundance of options for its 17,000 students on the Morgantown campuses.

The concentration of University programs in one location, including the WVU Medical Center, results in a wider choice of courses as well as opportunities for interdisciplinary learning and research. For example, faculty and students in electrical engineering and speech pathology-audiology have collaborated in developing and using electronic teaching aids for children with hearing impairments.

Although located in a small town in the Appalachian Mountains, WVU is a cosmopolitan community with students from the 49 other states and 50 foreign countries. Many students are from families with modest incomes. They can afford to attend WVU because it ranks among the ten institutions of its kind in the nation with the lowest charges for state residents. About 35 percent of WVU's students also receive some financial aid. The male-female ratio is 5 to 3. And WVU has sent 17 Rhodes Scholars to Oxford University in Great Britain, far more than universities in neighboring states. More than half of the faculty members have doctoral degrees. They are graduates of 400 American colleges and universities and 75 foreign institutions. The faculty-student ratio is 1 to 19.

WVU also offers its students a variety of off-campus learning experiences — working in a state mental hospital and with social welfare agencies; touring the state with the only free traveling Puppet Mobile in the United States or with performing musical groups; summer overseas programs including foreign language courses in France, West Germany, and Colombia, and a European tour in the humanities; a semester in the coal-mining region of Wales, England, for social work graduate students; seaside biology and geology courses at Lewes, DE, and Wallops Island, VA, through the Marine Science Consortium, and geology classes at the Florida Keys; a U.S. tour in agriculture; and a program in Renaissance and eighteenth century studies at the Folger Shakespeare Library in Washington, D.C.

West Virginia University provides outstanding facilities for its students and faculty including the Library, which contains more than a million items and 7,000 periodicals, and the Computer Center, which has a $3.5 million, third-generation computer. There are branch libraries and computer terminals on all the campuses. WVU's growth in physical facilities since 1958 has been equaled by few universities of its size in the nation. More than $100 million in new buildings have been constructed, including one of the nation's finest creative arts centers.

The campuses in Morgantown contain 57 buildings on 610 acres. A University-operated, inter-campus bus system connects the campuses and an internationally unique Personal Rapid Transit System — featuring small automated cars operated by computers — is being completed between downtown Morgantown and the campuses. The system, which is being built by the U.S. Department of Transportation as a research and demonstration project, hopefully will relieve traffic congestion and critical parking problems on the Downtown Campus and at the Medical Center.

The WVU Center for Appalachian Studies and Development, organized in 1963, has pioneered nationally in broadening the role of the Cooperative Extension Service from strictly agricultural education to community development. The Appalachian Center takes educational opportunities to the people through six area centers and offices in the fifty-five West Virginia counties. All of WVU's colleges and schools also are involved in off-campus programs, which have been recognized nationally for developing new approaches in such fields as rural development, drama, a master's degree in business administration offered primarily through videotaped and live telelectures, and the School of Nursing telelecture system that connects 71 hospitals in 45 communities with the WVU Medical Center.

For research and teaching purposes, WVU operates nine experiment farms in Hardy, Jefferson, Mason, Monongalia, Preston, Randolph, and Wetzel counties; seven forests in Greenbrier, Mingo, Monongalia, Preston, Raleigh, Randolph, Wetzel, and Wyoming counties; a biological station near Terra Alta; a geology camp near White Sulphur Springs; and state 4-H facilities at Jackson's Mill.

Other WVU branches include the Charleston Division of the Medical Center, the Greenbrier Valley Extension Center at Lewisburg, and Potomac State College at Keyser, which is a junior college offering two-year programs. Potomac State's transfer programs, designed to conform to the WVU lower division, provide the freshman and sophomore years in the liberal arts and sciences, as well as pre-professional studies in agriculture, business and economics, computer science, dentistry, education, engineering, forestry, home economics, journalism, law, medicine, medical technology, nursing, pharmacy, physical education, physical therapy, and social work. Occupational programs, which lead to the Associate in Arts degree, include accounting, agriculture, computer programming, engineering, and secretarial studies.

Government and Organization of WVU

The *West Virginia Board of Regents* is vested by law with authority for the control and management of the University and all other state institutions of higher education. Serving on the Board are nine members appointed by the Governor with advice and consent of the Senate. The State Superintendent of Schools is an ex officio member. The seven members of the WVU Advisory

Board are appointed by the Board of Regents to serve as consultants to the president.

The president, appointed by the Board of Regents, is the chief executive officer of the University as well as its principal academic officer, a role which his position as presiding officer of the University Senate symbolizes. The president's office staff includes the provosts and assistants to the president.

The *University Senate* is the vehicle for faculty participation in the government of the University. It is a legislative body with original jurisdiction over all matters of academic interest and educational policy that concern the entire University or affect more than one college, school, or division. The senate's decisions are subject to review and approval by the president and the Board of Regents. The senate includes the president of the University as chairperson, provosts, academic deans, five administrative officers appointed by the president, and senators elected by members of the University Faculty Assembly to represent their college and other constituencies. Each constituency is entitled to one senator for each twenty constituents who are members of the University Faculty Assembly. The senate normally meets once each month.

The *University Faculty Assembly* includes the president of WVU as presiding officer, provosts, academic deans, professors, associate professors, assistant professors, and instructors holding appointments on a full-time basis. The Faculty Assembly normally meets twice a year.

West Virginia University also has a tradition of strong *Student Government* that touches all aspects of student life and represents student opinion to the administration and faculty. Student administration has three main branches: Executive, including the student body president and vice-president who are elected every spring; Legislative; and the Academic Study Forum. A total of 95 students also serve on 39 University committees including the Committee on Student Discipline (two student members and three faculty members) and the Mountainlair Advisory Council (four students and four faculty members).

For non-teaching employees, there is the Staff Council, which consists of twelve members elected by their fellow employees in six occupational groups, and International Laborers Union Local 814, AFL-CIO, which represents many employees.

Morgantown Area

Morgantown has a population of 29,000; Monongalia County, 64,000. Monongalia is one of the largest deep-mine coal-producing counties in the nation, with production exceeding ten million tons annually. WVU is the largest single employer.

Located on the east bank of the Monongahela River, which flows north to Pittsburgh, Pennsylvania, Morgantown is situated on rugged terrain of the Appalachian Highlands. The altitude of the city varies from 800 to 1,150 feet above sea level, while the surrounding hills rise eastward to Chestnut Ridge and reach an altitude of 2,600 feet just ten miles from the city.

The area's temperate climate is marked by four distinct seasons of about equal length. Morgantown's valley location allows it to usually escape the extremes of winter — downtown snowfall averages only 25 inches annually and cold waves, which average about three a year, are blunted by the hilly terrain. Heavy winter clothing isn't usually needed until after Thanksgiving.

Morgantown is served by Greyhound bus and by Allegheny Airlines.

A new north-south interstate highway, I-79, is just one mile west of Morgantown. U.S. Routes 19 and 119 pass through Morgantown in the north-south direction. Construction of U.S. 48, a four-lane, east-west highway, is underway in the Morgantown area. It will tie I-79 and I-81 together between Morgantown and the Cumberland-Hagerstown, Maryland region. Pittsburgh is 65 miles north of Morgantown. The cities of Charleston (West Virginia), Washington, Baltimore, Cleveland, and Columbus, Ohio, all lie from 185 to 220 miles distant.

Because of WVU's intellectual resources, the Morgantown area is becoming the major research center in the Appalachian region. Four federal agencies have research facilities in the area — the Department of Health, Education, and Welfare (the Appalachian Center for Occupational Safety and Health), the Forest Service (the Forestry Sciences Laboratory), the Morgantown Energy Research Center of the U.S. Bureau of Mines, and the Soil Conservation Service (West Virginia headquarters). The American Association of Cost Engineers moved its national headquarters to Morgantown primarily because of WVU's computer and other resources.

Two installations add to the area's variety. They are the Robert F. Kennedy Youth Center, a model rehabilitation facility for youths who violate federal laws, and an earth tracking station of the Communications Satellite Corporation in neighboring Preston County (its 97-foot diameter antenna sends and receives world-wide telephone and other communications from satellites in outer space).

Living Accommodations

The University Housing Office, 440 Medical Center Drive (phone 304/293-3621), is a source of information concerning both University and privately owned off-campus housing. The University maintains nine residence halls, four for men and five for women. It also operates several hundred furnished and unfurnished apartments for married students, graduate students, faculty, and staff.

The Federal Housing Administration describes the Morgantown housing market as "fairly tight." So you should make arrangements for housing well in advance of the semester in which you enroll. Parking is extremely limited on the University's Downtown Campus and at the Medical Center.

Part 2

ADMISSIONS, FEES AND EXPENSES, REGULATIONS AFFECTING DEGREES

Admissions

Students may be considered for admission to WVU on the basis of graduation and transcripts from accredited high schools. High school graduates are required to present credit for 4 units of English and 1 unit of algebra. In addition, agriculture, chemistry, forestry, geology, mathematics, physics, and the health sciences require 1 unit of geometry. Engineering and mining majors are required to present 2 units of algebra, 1 unit of geometry and ½ unit of trigonometry, or its equivalent. Students who do not meet these requirements in mathematics may apply for admission to the pre-engineering program in the College of Engineering or the School of Mines.

Special admissions regulations for individual colleges or schools appear in Part 3 of this *Catalog* and in Parts 4-10 of the *WVU Graduate Catalog.* For admission to the various graduate programs, the School of Dentistry, School of Medicine, School of Pharmacy, or the College of Law, see the *WVU Graduate Catalog.*

All students are required to take the American College Testing Program tests (ACT) and have the report of scores sent to WVU. This test is not used for admission, but for placement, and no other test may be substituted for it.

Students interested in financial assistance must file a Parents Confidential Statement with College Scholarship Service, Midwest Region Office, 990 Grove Street, Evanston, IL 60201. Forms are available at high schools or from the College Scholarship Service. Submit only forms dated for the current academic year.

West Virginia high school students should obtain applications for admission from their high schools. Out-of-state students may write the WVU Office of Admissions and Records and request an application form. Applicants should prepare their part of the application and then return it to their school. The school then will send the completed application and a transcript of the student's high school grades directly to the WVU Office of Admissions and Records.

Students should apply for admission when they have met these requirements.

Non-academic policies and regulations affecting students are summarized in the *Student Handbook.* Every student is urged to obtain a copy of the *Student Handbook* from the Office of Student Educational Services, 109 Martin Hall.

West Virginia Residents:

1. If, after 6 semesters of secondary school, the student has a grade-point average of 2.5 of a possible 4.0 (C+ or above), the student should apply as soon as possible after September 15.

2. If, after 7 semesters of secondary school, the student has a grade-point average of 2.0 of a possible 4.0 (C or above), the student should apply as soon as possible after beginning the 8th semester.

3. If the student has a grade-point average of 2.0 of a possible 4.0 (C average) at graduation, the student should apply immediately after graduation from the high school.

4. Return the application to the high school. The school will complete the confidential report and mail the application, the computer sheet, and a copy of your high school transcript to the WVU Office of Admissions and Records. If applying on the basis of the GED examination, an official copy of the student's test scores and diploma must be sent to the WVU Office of Admissions and Records.

Out-of-State Residents:

1. If, after 6 semesters of secondary school, the student has a grade-point average of 3.0 of a possible 4.0 (B or above), the student should apply as soon as possible after September 15.

2. If, after 7 semesters, the student has a grade-point average of 2.5 of a possible 4.0 (C+ or above), the student should apply as soon as possible after the beginning of the 8th semester.

3. If the student has a grade-point average of 2.0 of a possible 4.0 (C average) at graduation, the student should apply immediately after graduation from secondary school.

4. Return the application to the high school. The school will complete the confidential report and mail the application, the computer sheet, and a copy of the student's high school transcript to the WVU Office of Admissions and Records. If applying on the basis of the GED examination, an official copy of the student's test scores and diploma must be sent to the WVU Office of Admissions and Records.

Admission to Medical Center Programs

Applicants for admission to any of the schools of the WVU Medical Center should write to the Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, who will furnish official blanks upon which formal application must be made.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

When requesting an application by letter for any of the Medical Center programs, the permanent home address must be given.

A $10.00 application fee is required and must accompany the applications of all but Dental Hygiene students, who pay no application fee.

Any applicant who is refused admission, or who fails to enroll after acceptance, must re-apply in the regular manner if consideration for a subsequent year is desired.

Those applicants accepted for admission to any of the programs of the WVU Medical Center, except the Division of Dental Hygiene and out-of-state applicants to the School of Dentistry, are required to deposit $50.00 before

acceptance becomes official. Applicants accepted to the Division of Dental Hygiene deposit $40.00, and out-of-state applicants accepted to the School of Dentistry deposit $100. If the applicant enrolls in the program of the applicant's choice, the deposit is applied to first semester tuition.

If an application for admission to the School of Medicine is withdrawn after the applicant has been offered a place and has submitted a deposit, such deposit may be refunded any time before March 30 of the year in which enrollment is anticipated, but will not be refunded after this date. Deposits submitted to all other programs are nonrefundable.

It is required that during the first semester of the first year all WVU Medical Center students must complete certain prescribed immunization and diagnostic procedures.

Advanced Placement Credit

WVU encourages students to work to their full capacity and to advance as rapidly as appropriate in their academic work. A number of opportunities are open to both qualified high school juniors and seniors, as well as to adults returning to school after an interval of work or military experience, to demonstrate competence beyond that normally associated with graduation from high school.

High school students who take college-level subjects offered in their schools in cooperation with the CEEB Advanced Placement Program should take the appropriate three-hour examinations administered by the Advanced Placement Service and have the scores sent to WVU. Credit for corresponding WVU courses will be given for high achievement on these tests.

Applicants for admission to the University, especially those who have gained a significant level of maturity through their life experiences, may gain college credit for their educationally related experiences through the College Level Examination Program (CLEP) of the College Entrance Examination Board. Policy of the West Virginia Board of Regents allows University credit to be awarded for successful completion of any or all of the CLEP Subject Examinations, as well as allowing up to 30 hours of general education credit for successful performance on the CLEP General Examinations. Although the program is designed primarily for adults, exceptionally well qualified high school seniors may find it advantageous to seek advanced standing via the CLEP program. Interested applicants may write the Dean of Admissions and Records for further information regarding the CLEP program and WVU credit.

Advanced placement also may be granted for specific military experience. Returning veterans should consult the Dean of Admissions and Records and the WVU Veterans Counselor for details.

After admission to WVU, students may elect to take examinations demonstrating their competence in particular coursework. Credit or advanced placement is given for satisfactory completion of the tests. Students interested in challenging courses by examination should consult their advisers for procedures and details.

Admission of Transfer Students

Applicants for transfer from another college or university should submit the following to the Office of Admissions and Records:

1. A complete application for undergraduate admission.

2. A certified transcript of all college work taken to date, including a statement of good standing. A certified statement covering subjects subsequently taken should be sent as soon as it is available.

3. Catalog pages describing all subjects which have or will have been completed. The applicant's name should be written on each page and each subject indicated by a check mark in the margin. Complete catalogs should not be sent. (Not necessary from West Virginia colleges.)

The cumulative average of all work attempted before transfer must be at least C.

Credits and grades earned for all baccalaureate level courses at any baccalaureate degree-granting institution in the West Virginia state system of higher education and up to 72 hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia state system shall be transferable toward a bachelor's degree. (See also "Requirements As to Residence," page 30.)

Credits (though not grades) are transferable from institutions outside the West Virginia state system for courses carrying a grade of C or higher. A grade of D on the first of sequence courses may be transferred if the second course grade is C or higher.

Credits from two-year community colleges and junior colleges outside the West Virginia state system are limited to 72 hours of lower-division courses. These colleges must be accredited by the North Central Association of Colleges and Secondary Schools or another regional accrediting association.

The transfer of credits does not exempt the student from satisfying all the requirements for his degree program at WVU.

An average of 2.0 on all mathematics courses completed is required for transfer into the College of Engineering or School of Mines.

All transcripts must be in the Office of Admissions and Records three weeks in advance of registration.

Evaluation of transcripts for transfer of credit is furnished only after receipt of complete official transcripts and application for admission.

Transfer students generally are admitted only after they complete one full year at another institution. Applicants who have less than one full year of college work elsewhere must submit both their college and high school records. Students who have successfully completed 6 hours or less at another accredited institution will apply as freshmen.

Admission of Special Students

Persons not desiring to become candidates for a degree may, by special permission, be admitted as special students. Such students are subject in all respects to the usual rules relating to registration and scholarship. Admission to any class is subject to the approval of the instructor in charge.

Students who do not plan to follow a degree program at WVU should submit only a statement of good standing from the last college attended.

Admission of Foreign Students

Foreign citizens applying for undergraduate entrance must have their completed application available for review at least four months before the date of enrollment. Decisions about admission cannot be made until complete records have been received. Inquiries and application should be addressed to the Office of Admissions and Records.

Students applying as undergraduates should have completed the equivalent of a secondary education and ranked higher than average in their class.

Students with a native language other than English are required to take the Test of English As a Foreign Language (TOEFL). Applications for the test should be addressed to: TOEFL, Educational Testing Service, Princeton, NJ 08540.

Preliminary applications, prepared by the Institute of International Education, are avilable at United States consulates and United States Information Agency offices.

Foreign students should make all arrangements for their financial obligations to WVU and for their entire stay in the United States before leaving their countries.

Readmission

Undergraduate students who leave the University for at least one complete semester are required to submit an application for readmission to the Dean of Admissions and Records.

Students who have been suspended from the University must have written approval from the dean of the school or college from which the student was suspended.

Approval in writing must be secured in advance to elect courses offered elsewhere. An overall average of C is required on all work completed at WVU in order to obtain such approval. Credit will be accepted for transfer for courses carrying a grade of C or higher when the conditions indicated above have been met.

Students wishing to change their major upon readmission must have permission from their previous dean and the dean of the college to which they wish to transfer.

Intrauniversity Transfers

Students transferring from Potomac State College of WVU shall be considered intrauniversity transfers. All records made at Potomac State are part of the student's University record, but no more than 72 hours may be applied toward the baccalaureate degree.

If a change of major is involved, the transferee should consult the college, school, or department to which he is transferring concerning requirements for his new major.

Veterans

Veterans may be admitted to WVU with less than the minimum admission requirements necessary for other, nonveteran applicants.

Information regarding educational opportunities made possible at the University through provisions of the Veterans Readjustment Benefits Act of 1966 — G.I. Bill (Public Law 358), the Vocational Rehabilitation Program of the Veterans Administration (Public Law 16), and the War Orphan's Educational Assistance Act of 1956 (Public Law 634) may be obtained from the Veterans Counselor by personal conference or by mail. An amendment to Public Law 634 provides benefits to many dependents of 100 percent disabled veterans.

Veterans having at least one continuous year of military service may be exempted from the physical education general program. No scholastic credit is given. Present proof of military service to the Dean of Admissions and Records.

Summer Session

The summer session is nine weeks in length. It opens in June and closes in August. Requiremetns for admission and character of the work offered are the same for the summer session as for the regular academic year.

Credit may be obtained toward the bachelor's, master's, and doctorate. Offerings are varied from summer to summer so that students may complete work for the master's degree by attending summer session only.

For complete information, see the *WVU Summer Session Bulletin.*

Evening Education

The University offers a program of evening classes for the benefit of those who wish to continue their education beyond the high-school level and who are unable to attend the usual day classes.

All courses are taught by resident faculty members and carry full college residence credit. Many of these courses may be counted toward advanced degrees.

Visitors

Full-time University students may attend classes as visitors, provided they obtain the written permission of their advisers and of the instructors in classes they desire to visit. Members of the administrative or teaching staffs, or other regular employees of the University, may attend classes as visitors provided they obtain written permission of the chairperson of their departments and of the instructors in the classes which they desire to visit.

No record is kept of the work and attendance of persons admitted to classes as visitors and no credit is given for their work in such classes. Such persons may not obtain credit by advanced standing examinations in courses attended as visitors.

Auditors

Students may enroll in courses without working for grade or for credit by registering as auditors and by paying full fees. Change in status from audit to credit or from credit to audit may be made during the registration period. Attendance requirements for auditors shall be determined by the instructor of the course being audited. It is the prerogative of the instructor to strike the name of any auditor from grade report forms and to instruct the Office of Admissions and Records to withdraw the auditor from the class, if attendance requirements are not met.

Fees and Expenses

All West Virginia University fees are subject to change without notice.

All fees are due and payable at the Comptroller's desk in the Coliseum on the days of registration. (Medical Center students pay their fees on registration days at the Comptroller's Office, Basic Sciences Building.) Students must pay fees before registration is accepted and class tickets are released. Completion of arrangements with the Comptroller's Office for payment from University payroll checks, officially accepted scholarships, loan funds, grants, or contracts shall be considered sufficient for acceptance of registration. Fees paid after

regular registration must be paid to the University Cashier in Mountainlair. (Medical Center students pay at the Comptroller's Office, Basic Sciences Building.)

All students are expected to register on days set apart for registration at the beginning of each semester or session of the University.

No student will be permitted to register at the University after the twelfth day of a semester or the fourth calendar day of the summer session or a summer term. Days are counted from the first day of registration.

Any student failing to complete registration on regular registration days is subject to the Late Registration Fee of $10.00.

Students registering pay the fees shown in the fees charts, plus special fees and deposits as required.

No degree will be conferred upon any candidate prior to payment of all tuition, fees, and other indebtedness to any unit of the University.

Persons not registered as University students and who are not members of its administrative or teaching staffs shall not be admitted to regular attendance in University classes.

Special Fees

Late-registration Fee (nonrefundable) $10.00
(Not charged to full-time students who complete registration during the regular registration days set forth in the University Calendar. Not charged to part-time students who complete registration by the close of office hours on the eighth day following the beginning of General Registration.)

Graduation Fee 10.00
(Payable by all students at the beginning of the semester or term in which they expect to receive their degree.)

Student's Record Fee 1.00
(One transcript of a student's record is furnished by the Dean of Admissions and Records without charge. This fee charged for furnishing an additional transcript.)

Fee for Change in Registration (after 8th day) 1.00

Fee for Examination for Entrance Credit, per unit 1.00

Fee for Examination for Advanced Standing 3.00

Fee for General Educational Development Tests (high-school level) 15.00
(If the applicant applies for admission to and registers in WVU within twelve months of the date of qualifying for the test, a $10.00 credit shall be established for the applicant.)

Certificate of Advanced Study in Education 2.00

Fee for Reinstatement of Students Dropped From the Rolls 3.00

Diploma Replacement Fee 5.00

Physical Education Student Fee 10.00

Student Identification Card Replacement Fee 1.00

Correspondence Course in Guided Reading (per course) 1.00

Driver Education Laboratory Fee 20.00

Labor Education Service (for informal activities) 2.00-10.00

Social Work Field Supervisory Fee (per semester) 70.00

Fee for Examination of Candidate for Graduate Degree 1.00
(For graduate students not otherwise enrolled at time of final examination.)

Professional Engineering Degree (including $10.00 Graduation Fee) 25.00

Laboratory Fees

Consult departmental sections of this Catalog for information concerning nonrefundable laboratory fees, course fees, deposits, and microscope rental fees.

Mountainlair Construction Fee and Daily Athenaeum Fee

The following fees are charged all students, full-time and part-time, enrolled for regular courses of resident instruction at WVU in Morgantown.

Mountainlair Construction Fee	$20.00 per semester
Daily Athenaeum Fee	$ 1.50 per semester
Mountainlair Construction Fee	$12.00 per summer term in excess of 4½ weeks
Daily Athenaeum Fee	$ 1.00 per full summer session

These fees are nonrefundable unless the student withdraws officially before the close of general registration for the term or course in which the student has been enrolled.

Fees for Extension Courses

A fee of $14.00 per semester hour and an off-campus extension fee of $20.00 per course are charged for enrollment in each extension course. Fees for extension courses are due and payable at or before the first class meeting.

Undergraduate and Graduate Music Students

Full-time or part-time students registered for bachelors' or advanced degrees in Music or the Supervisory Training Program in Music pay the regular full-time or part-time fees for all courses in music. No additional fees are assessed for Applied Music.

Students registered in other colleges or schools, including the Graduate School, may enroll in class courses in music at the regular full-time rate or part-time fee per credit hour. These students also may enroll for Applied Music for a maximum of one half-hour lesson per week; the fee for this Applied Music instruction is $20.00 in addition to the tuition and registration fees.

Practice and Rental Fees

Practice Room — One hour a day, $6.00 per semester; two hours, $10.00; three hours, $14.00; four hours, $18.00.

Pipe-Organ Practice — One hour a day, $10.00 per semester.

Band and Orchestra Instruments — Rental fee, $2.50 per semester.

SEMESTER FEES IN COLLEGES AND SCHOOLS

(See Footnotes 1, 2, 3, 4)

College, School, Or Division	Full-Time[1] Resident	Full-Time[1] Nonresident
GROUP I Agriculture and Forestry Arts and Sciences Business and Economics Creative Arts Center Engineering Human Resources and Education Journalism Mines Physical Education Social Work	$105.00* plus Registration Fee of $50.00	$270.00* plus Registration Fee of $200.00 and Nonresident Undergraduate Student Service Fee of $100.00
GROUP II Dental Hygiene Law Medical Technology (Jr. and Sr. Years) Nursing Pharmacy Physical Therapy (Jr. and Sr. Years)	$120.00* plus Registration Fee of $50.00	$295.00* plus Registration Fee of $200.00 and Nonresident Undergraduate Student Service Fee of $100.00 (Law students excluded from Nonresident Undergraduate Service Fee)
GROUP III Dentistry Medicine	$182.00* plus Registration Fee of $50.00	$400.00* plus Registration Fee of $200.00

Part-Time[2]

Tuition, per semester hour	Resident	Nonresident
Undergraduate students	$ 9.00**	$41.25***
Graduate and Professional students (Dentistry, Law, Medicine)	14.00**	38.00***

The minimum rate for noncredit courses is that charged for one semester hour of credit.

*Includes Athletics Fee $8.25; Student Educational Services Fee $10.00; Daily Athenaeum Fee $1.50; Health, Counseling, and Program Services Fee $21.00; Mountainlair Construction Fee $20.00; Inter-Campus Bus System Fee $4.25.

**Includes $4.00 per semester hour Registration Fee.

***Includes $16.00 per semester hour Registration Fee and $8.25 per semester hour Nonresident Undergraduate Student Service Fee.

SUMMER SESSION FEES

(Subject to change)

Tuition (per semester hour)	Resident	Nonresident
Undergraduate students	$ 9.00*	$ 41.25**
Graduate and professional students (Dentistry, Law, Medicine)	14.00*	38.00**
Daily Athenaeum Fee****	1.00	1.00
Health, Counseling, and Program Services Fee***	12.25	12.25
Mountainlair Construction Fee per summer term in excess of four and one-half weeks****	12.00	12.00
Mountainlair Construction Fee per four and one-half-week summer term or any portion thereof****	6.00	6.00
Student Educational Services Fee***	5.00	5.00
Inter-Campus Bus System Fee***	2.00	2.00

*Includes $4.00 per semester hour Registration Fee.

**Includes $16.00 per semester hour Registration Fee and $8.25 per semester hour Nonresident Undergraduate Student Service Fee.

***Non-refundable fees required of full-time students. May be paid by part-time students who desire the services. Part-time students who elect to pay these fees must pay the same amount assessed full-time students.

****Fee required of all students. (Nonrefundable unless student withdraws officially before the close of general registration.)

[1]A full-time undergraduate student is one who is registered for 12 or more semester hours of work each semester of the regular academic year, or 9 or more semester hours of work during the 9-week summer session. A full-time graduate student is one who is registered for 9 or more semester hours of work each semester of the regular academic year, 6 or more semester hours of work during a 9-week summer session, or 3 semester hours of work during a 4½-week summer term. A full-time student during the regular academic year receives an Identification Card which entitles him to all athletic events. A full-time student during the regular academic year or during the summer session is entitled to free medical consultation and advice from the University physician. A moderate charge is made for room calls, X-ray, special laboratory tests, drugs furnished by the University Pharmacy, minor operations, treatment of fractures and dislocations, and intravenous treatment.

[2]A part-time undergraduate student is one who is registered for fewer than 12 semester hours per semester during the regular academic year, or for fewer than 9 semester hours during the 9-week summer session. A part-time graduate student is one who is registered for fewer than 9 semester hours per semester during the regular academic year, or for fewer than 6 semester hours during a 9-week summer session, or for fewer than 3 semester hours during a 4½ week summer term.

[3]The minimum rate for non-credit courses is that charged for one semester hour of credit.

[4]Tuition, Registration Fee, Athletics Fee, Student Educational Services Fee, Health, Counseling, and Program Services Fee, and Inter-Campus Bus System Fee. The Mountainlair Construction Fee and Daily Athenaeum Fee are nonrefundable after the twelfth day following the beginning of general registration.

ESTIMATED EXPENSES FOR MEDICAL CENTER PROGRAMS (First Semester)

Tuition and Registration are the same for both semesters. Some expenses such as fees, instruments, and book costs will be different for the second semester, generally less

School or Division		Resident		Nonresident	Fees	Instruments	Lab Costs, Uniforms, etc.	Books	Resident	Nonresident
Dental Hygiene*										
Freshman		170.00		595.00	23.00	5.00	10.00	55.00	263.00	688.00
Sophomore		170.00		595.00	5.00	17.00	12.00	40.00	244.00	669.00
Junior		170.00		595.00	10.00	210.00	75.00	44.00	509.00	934.00
Senior		170.00		595.00	5.00			30.00	205.00	630.00
Dentistry**										
First Year		232.00		600.00	34.00	800.00	40.00	140.00	1,246.00	1,614.00
Summer	***		***		27.00	800.00	40.00	100.00		
Second Year		232.00		600.00	53.00	500.00		200.00	985.00	1,353.00
Summer	***		***		27.00	50.00		50.00		
Third Year		232.00		600.00	50.00				282.00	650.00
Summer	***		***		27.00					
Fourth Year		232.00		600.00	15.00				247.00	615.00
Medical Technology*										
Junior		170.00		595.00	35.00		25.00	60.00	290.00	715.00
Summer		9.00		41.25	28.00		100.00	45.00	182.00	214.25
Senior		170.00		595.00	25.00				195.00	620.00
Medicine**										
First Year		232.00		600.00	45.00	50.00	20.00	110.00	457.00	825.00
Second Year		232.00		600.00	55.00	160.00	20.00	85.00	552.00	920.00
Third Year		232.00		600.00			10.00	75.00	317.00	685.00
Fourth Year		232.00		600.00			10.00	75.00	317.00	685.00
Nursing*										
Sophomore		170.00		595.00	5.00		80.00	85.00	340.00	765.00
Summer		54.00		247.50	18.00			25.00	97.00	290.50
Junior		170.00		595.00	5.00			55.00	230.00	655.00
Senior		170.00		595.00	5.00			57.00	232.00	657.00
Pharmacy*										
First Year		170.00		595.00	27.00		10.00	90.00	297.00	722.00
Second Year		170.00		595.00	27.00		10.00	65.00	272.00	697.00
Third Year		170.00		595.00	27.00		10.00	45.00	252.00	677.00
Physical Therapy*										
Junior		170.00		595.00	5.00	15.00	40.00	150.00	380.00	805.00
Senior		170.00		595.00	5.00		40.00	100.00	315.00	740.00
Summer		27.00		123.75	23.00				50.00	146.75

Tuition Fees

* Resident: $120.00 Tuition; $ 50.00 Registration
Nonresident: $295.00 Tuition; $200.00 Registration; $100.00 N/R Undergrad. Student Service Fee

** Resident: $182.00 Tuition; $ 50.00 Registration
Nonresident: $400.00 Tuition; $200.00 Registration

Part Time and Summer Session Fees Per Semester Hour

Dent. Hygiene, Med. Tech, Nursing — Resident $9.00; Nonresident $41.25
Pharmacy and Phys. Therapy — (Special Fees to be added) Resident $14.00; Nonresident $38.00

Special Fees:

FALL: + $21.50 (Student Union $20.00) (Daily Athenaeum 1.50)

SUMMER: + $ 7.00 per five-week term
+ 13.00 * under 9 hr. ** under 6 hr. — full term
+ 27.00 * 9 hr. or more ** 6 hr. or more

(For one hour or more.
Included in tuition fee for full-time students.)

*** Dentistry and Medicine

Total
First Semester

Refunding of Fees

A student who officially withdraws from University courses may arrange for a refund of fees by submitting to the University Comptroller evidence of eligibility for a refund.

To withdraw officially, a student must apply to the Dean of Admissions and Records for permission. Semester fees will be returned in accordance with the following schedule:

First refund period ending on the twelfth day following the beginning of general registration.	All Activity fees chargeable to Special Services and all other semester fees less $2.50. (Under no circumstances is the amount retained less than $2.50.)
Second refund period ending on the fifth Friday following the beginning of general registration.	70% of all refundable fees.[4]
Last refund period ending on the eighth Friday following the beginning of general registration.	40% of all refundable fees[4]

The second Friday following the beginning of general registration for the summer session is the end of the refund period.

No part of the Activity Fee is refundable unless the student withdraws from the University.

University policy provides that students called to the armed services of the United States may be granted full refund of refundable fees, but no credit, if the call comes before the end of the first three-fourths of the semester, and that full credit of courses be granted to persons called to the armed services of the United States if the call comes thereafter; provided, however, that credit as described above will be granted only in those courses in which the student is maintaining a passing mark at the time of departure for military service. In the recording of final grades, for three-fourths of a semester or more, both passing and failing grades are to be shown on the student's permanent record.

Identification Card

An identification card is issued to each full-time student upon paying full fees. It entitles the owner admission to certain University athletic events, various activities of student government, Health Service, and Mountainlair. Confiscation will result from misuse. The University reserves the right to refuse reissuance of an identification card.

Service Charge on Returned Checks

A service charge of 5 percent of the amount of each check returned unpaid by the bank upon which it is drawn shall be collected unless the student can obtain an admission of error from the bank.

If the check returned by the bank was in payment of University and registration fees, the Comptroller's Office shall declare the fees unpaid and registration cancelled if the check has not been redeemed within three days from date

of written notice. In such a case the student may be reinstated upon redemption of the check, payment of the 5 percent service charge, Reinstatement Fee of $3.00, and Late Payment Fee of $10.00.

Cost of an Academic Year's Work

A student's textbooks will cost approximately $100 a year and enrollment fees will approximate $310 to $340 if the student is a resident; or $1,140 to $1,154 if a nonresident. Nonrefundable fees range from $2.00 to $20.00. In Military Science (ROTC) and Air Force Aerospace Studies (ROTC) a $20.00 deposit is required to cover military equipment in the custody of the student, practically all of which is returned to the student when the student accounts for the equipment. Board and room may be obtained at from approximately $1,144 to $1,264 a year. Traveling expenses, clothing, and other miscellaneous items will depend largely upon the taste and habits of the individual student. In general, however, it may be said that the legitimate cost of a 9-month term of residence at the University ranges from $1,900 for resident students to $2,800 for nonresident students.

Residential Status

The West Virginia Board of Regents has adopted regulations governing the classification of students as residents or nonresidents for admission and fee purposes at all institutions under its jurisdiction.

General

Students enrolling in West Virginia University shall be classified as resident or nonresident for admission, tuition and fee purposes by the Dean of Admissions and Records. The decision shall be based upon information furnished by the student and all other relevant information. The Dean of Admissions and Records is authorized to require such written documents, affidavits, verifications, or other evidence as are deemed necessary to establish the domicile of a student. The burden of establishing residency for tuition and fee purposes is upon the student.

If there is a question as to residence, the matter must be brought to the attention of the Dean of Admissions and Records and passed upon at least two weeks before registration and payment of tuition and fees. Any student found to have made a false or misleading statement concerning his residence shall be subject to disciplinary action and will be charged the nonresident fees for each session theretofore attended.

Residence Determined by Domicile

Domicile within the state means adoption of the state as a fixed permanent home and involves personal presence within the state with no intent on the part of the person to return to another state or country. West Virginia domicile may be established upon the completion of at least twelve months of continued residence within the state prior to the date of registration, provided that such twelve months residency is not primarily for the purpose of attendance at any institution of learning in West Virginia.

Establishment of West Virginia domicile with less than twelve months residence before the date of registration must be supported by proof of positive and unequivocal action, such as, but not limited to, the purchase of a West Virginia home, full-time employment within the state, paying West Virginia property tax, filing West Virginia income tax returns, registering to vote in West

Virginia and the actual exercise of such right, registering of motor vehicles in West Virginia, and possessing a valid West Virginia driver's license. Additional items of lesser importance include transferring or establishing local church membership, involvement in local community activities, affiliation with local social, civic, fraternal, or service organizations, and various other acts which may give evidence of intent to remain indefinitely within the state. Proof of a number of these actions shall be considered only as evidence which may be used in determining whether or not a domicile has been established.

Minors

Minors are defined by the West Virginia Code (2-2-10) as persons under 18 years of age. The residence of a minor shall follow that of the parents at all times, except in extremely rare cases where emancipation can be proved beyond question. The residence of the father, or the residence of the mother if the father is deceased, is the residence of the unmarried or unemancipated minor. If the father and the mother have separate places of residence, the minor takes the residence of the parent with whom he lives or to whom he has been assigned by court order. The parents of a minor will be considered residents of West Virginia if their domicile is within the state.

A minor student who is properly admitted to an institution as a resident student shall retain that classification as long as he enrolls each successive semester.

Emancipated Minor

An emancipated minor may be considered as an adult in determining residence, provided satisfactory evidence is presented that neither of his parents, if living, contribute to his support nor claim him as a dependent for federal or state income tax purposes.

In the event that the fact of emancipation is established, the emancipated minor assumes all of the responsibilities of an adult to establish residence for tuition and fee purposes. Proof must be provided that emancipation was not achieved principally for the purpose of establishing residence for attendance at an institution of higher education.

Students 18 Years of Age or Over

A student 18 years of age or over may be classified as a resident if (1) the parents were domiciled in the state at the time the student reached majority and such student has not acquired a domicile in another state, or (2) while an adult the student has established a bona fide domicile in the state of West Virginia. Bona fide domicile in West Virginia means that the student must not be in the state primarily to attend an educational institution and he must be in the state for purposes other than to attempt to qualify for resident status.

Any nonresident student who reaches the age of 18 years while a student at any educational institution in West Virginia does not by virtue of such fact alone attain residence in this state for admission or tuition and fee payment purposes.

A student who is properly classified as a resident at the time that he reaches the age of 18 shall continue to be classified as a resident as long as he enrolls each successive semester and does not establish a domicile, or legal residence, in another state.

Change of Residence

An adult student who has been classified as an out-of-state resident and who seeks resident status in West Virginia must assume the burden of proving conclusively that he has established domicile in West Virginia with the intention of making his permanent home in this state. The intent to remain indefinitely in West Virginia is evidenced not only by a person's statements but also by his actions. The Dean of Admissions and Records in making his determination shall consider such actions as, but not limited to, the purchase of a West Virginia home, full-time employment within the state, paying West Virginia property tax, filing West Virginia income tax returns, registering to vote in West Virginia and the actual exercise of such right, registering of motor vehicles in West Virginia and possessing a valid West Virginia driver's license. Additional items of lesser importance include transferring or establishing local church membership, involvement in local community activities, affiliation with local social, civic, fraternal or service organizations, and various other acts which may give evidence of intent to remain indefinitely within the state. Proof of a number of these actions shall be considered only as evidence which may be used in determining whether or not a domicile has been established. Factors militating against a change in residence classification may include such considerations as the fact that the student is not self-supporting, that he is carried as a dependent on his parents' federal or state income tax returns or his parents' health insurance policy, and that he customarily does not remain in the state when school is not in session.

Marriage

The residence of a married person is determined by the same rules of domicile which would apply if he or she were not married.

Military

An individual who is on active military service or an employee of the federal government may be classified as a resident for the purpose of payment of tuition and fees provided that he established a domicile in West Virginia prior to entrance into federal service claimed, or established a domicile in another state. Sworn statements attesting to these conditions may be required. The wife and dependent children of such individuals shall also be classified as residents of the state of West Virginia for tuition and fee purposes. Persons assigned to full-time active military service and residing in West Virginia may be classified as in-state residents for tuition and fee purposes after twelve months continuous location in the state.

Aliens

An alien in the United States on a resident visa, or who has filed a petition for naturalization in the naturalization court, and who has established a bona fide domicile in West Virginia may be eligible for resident classification, provided he is in the state for purposes other than to attempt to qualify for residency status as a student.

Appeal Process

The decisions of the Dean of Admissions and Records may be appealed to the President of West Virginia University. The President may establish such committees and procedures as he determines necessary for the processing of appeals. The decision of the President of the University may be appealed in writing with supporting documentation to the West Virginia Board of Regents

in accord with such procedures as may be prescribed from time to time by the Board.

Regulations Affecting Degrees

Candidates for degrees are eligible for graduation when they complete the requirements in the college or school in which they are registered which were in effect at the time of their first registration in that college or school, provided they apply for graduation within a period of seven years from the time of their first registration. Students who fail to complete the requirements for graduation within seven years from their first registration shall satisfy the requirements in effect at the time they apply for graduation.

University policy provides that in view of public and professional responsibilities, the faculty of each of the professional schools of WVU has the authority to recommend to the President of the University the removal of any student from its rolls whenever, by formal decision reduced to writing, the faculty finds that the student is unfit to meet the qualifications and responsiblities of the profession.

All degrees are conferred by the Board of Regents upon recommendation of the faculties of the various colleges and schools. Degrees are granted at the close of the semester or summer session in which the students complete their work.

Attendance at the spring Commencement is voluntary. If you don't plan to attend, leave the complete mailing address to where you want your diploma mailed at your dean's office.

Baccalaureate Degrees

Credits and Grade Points Required

Less than 6 hours in an ancient or modern language will not be counted toward any University degree, diploma, or certificate unless work in the same language has been offered for entrance.

Six hours of English composition and rhetoric (English 1 and 2) are required of all candidates for the bachelor's degree in all colleges and schools of the University.

Two hours of physical education, to be taken during the first year in residence, are required for graduation, except in the case of students entering with advanced standing amounting to 58 semester hours or more. (See "General Program" in the School of Physical Education section of this *Catalog*.) The University Health Service will determine whether students are physically qualified for required physical education courses and for active participation in other University activities.

Each baccalaureate degree is conditioned upon the completion of a specified number of semester hours of credit.

All academic units of the University require minimum standards of scholastic quality. Grade points are computed only on grades earned at WVU and at other institutions in the West Virginia state system of higher education. To be eligible for graduation, a student must have a grade-point average of 2.0 (C) or higher on all work for which the student receives grades (except W, WU, and P). In addition, specific degree programs may require minimum grades of C, or in some cases higher than C, in specific courses or portions of the baccalaureate program.

It is the student's responsibility to keep informed of the student's grade-point standing. This information may be obtained at any time from the dean of the college or school in which the student is registered.

Seventy-two hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia system of higher education may be applied toward a baccalaureate degree at WVU. Transfer credit for college-parallel courses completed at other community colleges and junior colleges may not exceed 72 hours. Transfer credit from community colleges and junior colleges is normally limited to lower-division courses.

Cum Laude and Magna Cum Laude Graduates

The University recognizes distinguished academic achievement by awarding initial baccalaureate degrees *Cum Laude* and *Magna Cum Laude* to qualified students. The following regulations govern these awards:

1. Grade-point averages for graduation *Cum Laude* or *Magna Cum Laude* shall be computed by either:

(a) Starting with the student's penultimate semester or term and continuing in reverse chronological order until at least 48 semester hours, excluding credits earned with a grade of P, have been counted. If, in order to total the required number of hours it is necessary to include any part of a semester or term, the work of the whole semester shall be included.

(b) The cumulative grade-point average in all work completed at WVU through the student's penultimate semester or term provided the total work completed is 49 semester hours or more.

2. Students who transfer to WVU from institutions within the West Virginia state system of higher education on or after January 2, 1972, may be eligible for graduation with honors based on either computational system stated above.

3. Students who transfer to WVU from institutions not within the West Virginia state system of higher education, may be eligible for graduation with honors from WVU provided they meet the requirements of paragraph 1(b) above.

4. Subject to the above conditions, all candidates for a baccalaureate degree whose grade-point average in the work covered by either 1(a) or 1(b) above, is 3.6 or higher, shall be graduated *Magna Cum Laude.* All those whose average is lower than 3.6 but is 3.3 or higher shall be graduated *Cum Laude.*

5. Fitting recognition of graduation *Cum Laude* or *Magna Cum Laude* shall be made on the candidate's diploma and in the Commencement program.

University Core Curriculum Requirements

I. Two semesters of work in composition and rhetoric (English 1 and 2). Students demonstrating special ability in the areas covered by English 1 and/or 2 can fulfill either or both of these course requirements and receive 3 hours of credit per course through advanced standing examinations. Those successfully completing one of the examinations have the credit, but no grade, recorded on their transcripts. Grade-point averages are not affected by advanced standing examination results. The Coordinator of Writing Programs in English or the Academic Advising Center of the College of Arts and Sciences will provide information about the examinations.

II. Remedial work in mathematics to cover the deficiency if the student, upon entering the University, lacks proficiency in mathematics equal to that normally attained in two years of high school mathematics.

III. Twelve* credit hours of work in selected approved courses in each of the three following areas, including courses in at least two subjects in each group:

Group A

1. Art
2. Drama
3. English (exclusive of English 1 and 2)
4. Humanities
5. Languages
6. Music
7. Philosophy
8. Religious Studies
9. Selected Multi-Disciplinary Studies
10. Speech Communication

Group B

1. Economics
2. Forestry 140
3. Geography
4. History
5. Political Science
6. Psychology
7. Selected Multi-Disciplinary Studies
8. Social Science
9. Sociology/Anthropology

Group C

1. Bacteriology
2. Biology
3. Chemistry
4. Entomology
5. Genetics
6. Geology
7. Mathematics
8. Nutrition
9. Physical Science
10. Physics/Astronomy
11. Physiology
12. Selected Multi-Disciplinary Studies
13. Statistics

*Two 4-credit courses and one 3-credit course may be substituted in lieu of 12 credit hours.

The determination as to whether ROTC courses will be counted toward fulfillment of the core curriculum or will be counted as free electives is the prerogative of the department chairperson or dean of the appropriate college or school. This is in keeping with the Board of Regents' orders effective at the end of the first semester of the 1967-68 academic year which stipulated that "each academic division of the University must allow at least 8 hours of credit toward graduation for courses in Military Science (ROTC) and Air Force Aerospace Studies (ROTC), if earned during the first two years of enrollment . . . A student electing to take Military Science (ROTC) or Air Force Aerospace Studies (ROTC) should consult his department chairperson or dean of his college or school for determination as to how the 8 hours of academic credit will be credited toward fulfilling graduation requirements."

Requirements As to Residence

A student who comes to WVU from another college or university should transfer not later than the beginning of the third year. In no case will a student who matriculates in WVU later than October 1 in any year be permitted to receive a degree at the next Commencement.

In special cases, students who desire to leave WVU at the close of their third year to enter another institution for the purpose of taking a combined course leading to two degrees or of preparing for graduate study, upon application beforehand to the Committee on Academic Standards of the college or school in which they are registered, may be permitted to do the work of the fourth year, or a part thereof, at such other institution and to receive the bachelor's degree from WVU upon the presentation of the proper credits.

The transfer student whose undergraduate work has been altogether in institutions within the West Virginia state system of higher education must complete either the last 30 hours of work, or a minimum of 36 hours including 16 of the last 32 hours, in residence. Other transfer students must complete either a total of at least 90 hours or the last 30 hours in residence at WVU. The transfer student may be required to earn up to 15 hours in the major field in residence regardless of the number of hours and the nature of the courses transferred.

College Credit Defined

A college credit or semester hour represents the amount of work done in one recitation hour per week for the duration of a semester. Normally a student will spend two hours preparing for an hour recitation period. As a rule, two to three hours of laboratory work are equivalent to one hour of recitation.

Work Done Out of Residence

It is WVU policy to discourage the taking of regular residence courses in absentia. In the case of courses begun at WVU and not completed because of illness or for other acceptable reasons, however, permission to complete the work in absentia under the direction of regular WVU instructors may be granted by the Commiteee on Academic Standards of the college or school concerned; but in such case credit should be given only upon a report of a grade of no less than C on final examination. This regulation does not apply to WVU extension courses.

After a student enrolls on the Morgantown campus, the student must obtain advance approval in writing from the student's adviser, dean, and the Dean of Admissions and Records to obtain credit toward a degree for courses offered at other institutions and undergraduate branches of WVU. An overall average of C is required on all work completed at WVU in order to obtain such approval. Transfer credit from schools not affiliated with WVU will be accepted for courses carrying a grade of C or higher when conditions indicated above have been met.

Credit for Correspondence Work

Credit up to a maximum of 30 semester hours for work completed by correspondence in nonlaboratory courses will be accepted by WVU when such work is given by accredited colleges or universities that accept work for credit toward their own degrees and whose residence work is accepted by WVU.

Substitution for Required Courses

A student who desires to substitute another course for any prescribed in the student's curriculum or required for the degree toward which the student is working must obtain permission for such substitution from the Committee on Academic Standards in the student's college or school.

Withdrawal from Class or University

A student who desires to withdraw from WVU must obtain a withdrawal form from the Office of Admissions and Records (or dean's office of an off-

campus instructional unit). Withdrawal procedure will be explained at that time.

A student who withdraws without following this procedure will receive at the end of the semester a grade of F (failure) in each of the courses for which the student is registered and will be indefinitely suspended from WVU unless certified as to incapacitation by the dean of the student's college or school.

A student who desires to drop part of the work at any time following registration may withdraw from classes in which enrolled until the end of the fifth week of classes. A student will not be permitted to withdraw from courses after the fifth week of each semester (second week of the longer summer session; first week of the shorter summer session); the first day being defined as the initial day of upper-class registration. A student who withdraws before that day shall receive a grade of W. After that day (last day on which withdrawal is allowed) a student will be allowed to withdraw only after approval by the Committee on Academic Standards. The grade to be recorded after that day will be W, if the work is satisfactory, or WU, if the work is unsatisfactory. No withdrawal will be permitted after 18 days before the last day of classes of a semester (9th day before last day of classes of a summer session) except for withdrawal from the University. (W or WU grades will not be used in the computation of the student's grade-point average.)

A student must obtain the adviser's approval for withdrawal. The withdrawal becomes official only after appropriate forms have been recorded by the Dean of Admissions and Records. If such withdrawal reduces the student's hour-load below the required minimum, or if the student is on academic probation, the student must obtain approval of appropriate authorities of the college or school in which registered.

It is the student's responsibility to see that all forms are properly executed and delivered to appropriate authorities for recording.

A student may appeal to the dean of the college or school to adjust the student's schedule at any time.

A student must present a signed statement from the Librarian that all borrowed books have been returned and library fines have been paid before withdrawal is allowed.

Re-Enrollment After Withdrawal

An undergraduate student who withdraws from WVU in two consecutive semesters (excluding summer session) may not register for further work without approval of the dean of the college or school in which the student wishes to register and subject to conditions set by that dean.

Examinations and Reports

Courses

As a rule courses extend through one semester only, although some are of a year's duration. No credit will be given for less than an entire course except by special order of the Committee on Academic Standards. Grades given at the end of the first semester in courses extending throughout the year are merely indicative of the quality of work done by the student to that point and do not give credit for the part of the course so far completed. Such first-semester grades may be considered in determining the final grade, however.

Summer session courses carry the same credit value as courses offered in the regular semesters.

Evaluation of Student Progress

Measurement and evaluation of learning, consistent with the objectives of the course, provide opportunity for the student and the teacher to evaluate progress through a variety of methods. Evaluation by final examination alone is discouraged.

Students are responsible for all material presented or assigned in scheduled instructional sections. Failure to complete all assigned work may result in a report of I or a grade of F at the discretion of the instructor.

Final examinations are held during the last week of each semester of the academic year and during the last two days of each summer session. A listing in the *Schedule of Courses* each semester sets the time for each final examination.

The only tests permitted during the week of classes preceding finals will be in evening classes, practical laboratory tests, make-up examinations, and regularly scheduled short quizzes.

Absence from Examinations

The student is required to take all regular examinations. If a student attends a course throughout the semester and is absent from the final examination without permission, the instructor shall count the examination as zero and report the final grade as F. If, in the opinion of the instructor, absence of the student was for satisfactory reason, the grade of I may be reported.

A student who has been absent because of illness, authorized University activities, or other reasons approved by the student's dean, has the opportunity to make up regularly scheduled examinations.

Reports

In the seventh week of classes of each semester, instructors in all undergraduate courses shall submit a report of students doing unsatisfacotry work, that is, earning grades of D or F. These grades are used for counseling and are not recorded on the student's permanent record in the Office of Admissions and Records. These reports are sent to the Dean of Admissions and Records or a representative and this information is transmitted to the student, parent or guardian, adviser, and dean of the college or school.

Final grades are reported by instructors directly to the Office of Admissions and Records within 48 hours after the closing of the examination. The rule also applies to the final grades of all students registered in other colleges or schools of WVU who are enrolled in law courses.

The final standing of all seniors provisionally approved for graduation at the close of the second semester shall be reported by their instructors to the deans of their colleges and schools, and the final standing of all graduate students provisionally approved for graduation shall be reported to the Dean of the Graduate School. Special report cards are supplied by the Dean of Admissions and Records.

A report of each student's work is made at the close of the semester or summer session to the student or to the student's parents or guardian.

Classification of Students

The following shows the number of semester hours required for classification as second-year, third-year, and fourth-year students:

Freshman Classification	1-28 Hours, inclusive
Sophomore Classification	29-58 Hours, inclusive
Junior Classification	59-88 Hours, inclusive
Senior Classification	89-or More Hours, inclusive

Degree Programs Offered by WVU

College of Agriculture and Forestry

Major or Degree Program	Bachelor	Master	Doctorate
Agricultural Biochemistry		M.S.	Ph.D.
Agricultural Economics		M.S.	
Agricultural Education	B.S.Agr.	M.S.	
Agricultural Microbiology			Ph.D.
Agriculture		M.Agr.	
Agronomy		M.S.	
Animal Nutrition			Ph.D.
Animal Science		M.S.	
Animal and Veterinary Sciences	B.S., B.S.Agr.		
Forest Resources Management	B.S.F.		
Forestry		M.S.F.	
Genetics		M.S.	Ph.D.
Horticulture		M.S.	
Landscape Architecture	B.S.L.A.		
Plant Pathology		M.S.	Ph.D.
Plant and Soil Sciences	B.S.Agr.		
Recreation	B.S.R.	M.S.	
Reproductive Physiology		M.S.	Ph.D.
Resource Management	B.S., B.S.Agr.		
Wildlife Management		M.S.	
Wildlife Resources	B.S.		
Wood Industries	B.S.F.		

College of Arts and Sciences

Biology	B.A.	M.A., M.S.	Ph.D.
Chemistry	B.A., B.S.	M.A., M.S.	Ph.D.
Computer Science	B.S.	M.S.	
Economics	B.A.		
English	B.A.	M.A.	Ph.D.
French	B.A.	M.A.	
Geography	B.A.		
Geology	B.A., B.S.	M.A., M.S.	Ph.D.
German	B.A.	M.A.	
History	B.A.	M.A.	Ph.D.
Interdepartmental Studies	B.A.		
Latin	B.A.		
Library Science	B.A.		
Mathematics	B.A.	M.A., M.S.	
Philosophy	B.A., B.S.		
Physics	B.A., B.S.	M.S.	Ph.D.
Political Science	B.A.	M.A.	Ph.D.
Public Administration		M.P.A.	

Major or Degree Program	Bachelor	Master	Doctorate
Psychology	B.A.	M.A.	Ph.D.
Russian	B.A.		
Sociology	B.A.	M.A.	
Spanish	B.A.	M.A.	
Speech Communication	B.A.	M.A.	
Statistics	B.S.	M.S.	

College of Business and Economics

Accounting	B.S.B.Ad.		
Business Administration	B.S.B.Ad.	M.B.A.	
Economics	B.S.	M.A.	Ph.D.
Finance	B.S.B.Ad.		
Industrial Relations		M.S.	
Marketing	B.S.B.Ad.		

Creative Arts Center

Art	B.A.	M.A.	
Drama	B.F.A.	M.A.	
Music	B.M.	M.M.	D.M.A. Ph.D., Ed.D.
Visual Art	B.F.A.	M.F.A.	

School of Dentistry

Dental Hygiene	B.S.		
Dentistry			D.D.S.
Orthodontics		M.S.	

College of Engineering

Aerospace Engineering	B.S.A.E.	M.S.A.E.	
Agricultural Engineering	B.S.Ag.E.	M.S.Ag.E.	
Chemical Engineering	B.S.Ch.E.	M.S.Ch.E.	
Civil Engineering	B.S.C.E.	M.S.C.E.	
Electrical Engineering	B.S.E.E.	M.S.E.E.	
Engineering		M.S.E.	Ph.D.
Industrial Engineering	B.S.I.E.	M.S.I.E.	
Mechanical Engineering	B.S.M.E.	M.S.M.E.	
Theoretical and Applied Mechanics		M.S.T.A.M.	

College of Human Resources and Education

Counseling and Guidance		M.A.	C.A.S.
Education			Ed.D.
Education Administration		M.A.	C.A.S.
Educational Psychology		M.A.	
Elementary Education	B.S.	M.A.	C.A.S.
Family Resources	B.S.	M.S.	
Reading		M.A.	C.A.S.
Rehabilitation Counseling		M.S.	
Secondary Education	B.S.	M.A.	C.A.S.
Special Education		M.A.	C.A.S.
Speech Pathology and Audiology	B.S.	M.S.	

School of Journalism

Journalism	B.S.J.	M.S.J.	
Journalism Education	B.S.J.Ed.		

Major or Degree Program	Bachelor	Master	Doctorate
College of Law			
Law			J.D.
School of Medicine			
Anatomy		M.S.	Ph.D.
Biochemistry (Medical)		M.S.	Ph.D.
Medical Technology	B.S.	M.S.	
Medicine			M.D.
Microbiology		M.S.	Ph.D.
Pharmacology		M.S.	Ph.D.
Physical Therapy	B.S.		
Physiology and Biophysics		M.S.	Ph.D.
School of Mines			
Engineering of Mines	B.S.E.M.	M.S.E.M.	
Petroleum Engineering	B.S.Pet.E.	M.S.Pet.E.	
School of Nursing			
Nursing	B.S.		
School of Pharmacy			
Pharmaceutical Sciences		M.S.	
Pharmacy	B.S.		
School of Physical Education			
Education in cooperation with HRE			Ed.D.
Physical Education	B.S.P.E.	M.S.	C.A.S.
Physical Education Interdisciplinary	B.S.P.E.		
Safety Education		M.S.	C.A.S.
School of Social Work			
Social Work	B.S.	M.S.W.	

Grading, Grade Points, Absences, Auditors, Advisers, Academic Standing, and Cheating

Grading System

A — excellent (given only to students of superior ability and attainment)

B — good (given only to students who are well above average, but not in the highest group)

C — fair (average students)

D — poor but passing

F — failure

I — incomplete

W — withdrawal before the end of the fifth week of a semester or withdrawal doing satisfactory work thereafter

WU — withdrawal doing unsatisfactory work (after the fifth week of a semester)

P — pass (see Pass-Fail Grading below)
X — auditor, no grade and no credit
CR — credit but no grade
PR — progress. Final grade at end of the second semester (Medical Center)

Certain Approved Graduate Courses

S — Satisfactory
U — Unsatisfactory (equivalent to F)

Pass-Fail Grading

Certain students may elect to take one course each semester or summer session in which the grade earned will be either P (pass) or F (fail).

To be eligible, the student must be a full-time junior or senior enrolled in a baccalaureate program and must not exceed a total of 16 credit hours in courses graded by Pass-Fail only. In addition, the course selected for Pass-Fail grading must not be closed to undergraduate enrollment, required by the student's major or minor, required for state certification, nor be part of the University Core Curriculum requirement.

The selection of a course for Pass-Fail grading must be made at registration with the approval of the student's academic adviser and may not be changed after the close of the registration period.

Grade Points

The grade-point average is computed on all work for which the student has registered, except for courses with grades of W, WU, P, and X, and is based on the following grade-point values:

A	B	C	D	F	I	U
4	3	2	1	0	0	0

Provided, however, that when a student receives a grade of I and later removes the incomplete grade, the average grade-point standing shall be calculated on the basis of the new grade.

If the final grade of a student in any course is F, the student must take the course again in residence at WVU if the student desires to receive credit for it, unless the dean of the college or school authorizes the exception. The grade of I is given when an instructor believes that the coursework is unavoidably incomplete or that a supplementary examination is justifiable. The grade of I must be removed within the following semester or the next semester in which the student is in residence, and becomes a failure unless special permission is granted by the appropriate Committee on Academic Standards to postpone removal.

For teacher certification the student is responsible for every registration in a course for which a grade of A, B, C, D, F, WU, P, or I is received. The WVU grade-point average is computed on all work attempted in all years.

Absences

Students who are absent from class for any reason are responsible for work missed.

Students should understand that absences may jeopardize their grades or continuance in the course.

Instructors who use absence records in the determination of grades must announce this fact to students (in writing) within the first five class meetings.

It is the responsibility of the instructor to keep an accurate record of all students enrolled in the instructor's classes.

Instructors may report excessive absences to the student's dean or adviser.

Students who have been absent because of illness, authorized University activities, or other reasons approved by their deans, have the opportunity to make up regularly scheduled examinations.

Auditors

Students may enroll in courses without working for grade or for credit by registering as auditors and by paying full fees. Change in status from audit to credit or from credit to audit may be made during the registration period. Attendance requirements for auditors shall be determined by the instructor of the course being audited. It is the prerogative of the instructor to strike the name of any auditor from grade-report forms and instruct the Office of Admissions and Records to withdraw the auditor from the class if the audtior fails to meet attendance requirements.

Advisers

Each student entering WVU is assigned an adviser whose duty is to assist students in preparing schedules, assign them to classes, and certify their study lists to the Dean of Admissions and Records. The adviser is expected to give such advice and sympathetic guidance as the students may need in the pursuance of their work in the University. Students are expected to go freely to their advisers to discuss their problems.

Advisers, upon receipt of reports of excessive numbers of absences, shall have conferences with the students concerned and shall make such recommendations and adjustments as are desirable and feasible. If the adviser does not find a satisfactory solution after a conference with the student, the case shall be reported to the dean of the college or school.

Uniform Academic Suspension Regulations

Any undergraduate student in a baccalaureate curriculum whose total grade-point average is less than 2.0 but whose total grade-point deficiency is not large enough to cause suspension, will be notified on the student's grade report from the Dean of Admissions and Records that the student's academic performance is unsatisfactory. Any further action or restriction is entirely the prerogative of the individual college or school.

Any undergraduate student in a baccalaureate curriculum with a grade-point deficiency which exceeds the maximum allowed by the uniform University regulation (see Table below) shall be subject to academic suspension by the dean of the college or school.

Academic suspension identifies the status of a student who has failed to meet the University minimum standards and who has been notified formally by the dean of the college or school of academic suspension. A suspended student may not register for further work without prior approval of readmission by the Academic Standards Committee and the dean of the college or school. Action on academic suspension is to be taken by the appropriate dean at the end of each semester and such action is to be based on a special report from the Dean of Admissions and Records. The sequence of events in bringing about this action is:

1. The Dean of Admissions and Records will forward a special report at grade-reporting time to the college deans for appropriate action.

2. The Dean of Admissions and Records will provide the Provost for Instruction with a list of students subject to suspension in each college or school.

3. Deans will report to the Provost for Instruction the action taken on the students reported to them for academic suspension by the Dean of Admissions and Records.

4. A dean may suspend a student who fails to meet the requirements of academic probation set by the Committee on Academic Standards of the student's college or school.

Students who have been suspended may petition the Committee on Academic Standards of the college of enrollment after the next March 1st or October 1st to ascertain under what conditions, if any, they may be readmitted to that college.

A student suspended for academic reasons who fails to gain readmission to the college or school of the student's choice shall, upon application, be readmitted after one calendar year from the date of suspension, as a Remedial Study student in the College of Arts and Sciences. A Remedial Study student enrolls under special probationary rules that require a 2.0 grade-point average in each semester of enrollment. As a Remedial Study student, the student is not liable to suspension because of cumulative grade-point deficiencies. A student may, after successfully bringing the cumulative grade-point average up to 2.0, petition to have the work completed as a Remedial Study student apply toward the completion of degree requirements as may be appropriate.

Suspension by these procedures shall be termed academic suspension and the above regulations supersede all other regulations for academic suspension.

MAXIMUM ALLOWABLE GRADE-POINT DEFICIENCY

Total Hours Attempted	*Maximum Grade-Point Deficiency*	*Total Hours Attempted*	*Maximum Grade-Point Deficiency*
0-20	32	61-65	12
21-25	26	66-70	12
26-30	20	71-75	11
31-35	19	76-80	10
36-40	18	81-85	9
41-45	17	86-90	8
46-50	16	91-95	7
51-55	15	96 and above	6
56-60	14		

Duties of Committee on Academic Standards

The Committee on Academic Standards shall have authority to proceed according to its best judgment in regard to students referred to it for consideration.

All orders of the committee shall become effective when approved by the dean of the college or school.

In exercising its authority the committee shall not suspend a student during a semester except for willful neglect and in cases where the student's class grades are so low that further class attendance would be a waste of time. No

suspension shall become effective until approved by the dean of the college or school.

Procedural Rules for Handling Cheating Cases

Cheating is condemned at all levels and in all areas of life. Like a crippling malady, it leaves its mark subjectively. Cheating indicates a weakness and inability to meet and face the issues and problems of life. It creates an atmosphere of mistrust, disrespect, and insecurity. The effects and influence of cheating will necessarily be reflected in commerce and government and in all of the professions and callings, as well as in the classroom and in the home. Students of the University should act to discourage and eliminate cheating of every kind and character for the moral and mental well-being of themselves and their fellowmen. Likewise, the teaching faculty should remove and eliminate every situation which provides avenues and opportunities for cheating, thereby contributing to the inculcation of the principles of honesty, integrity, self-reliance, and self-respect in students. It is expected that University officials will have little occasion to place in operation the established procedures for handling cheating cases. Through these procedures and by means of a continued awareness, on the part of both faculty and students, of the intellectually and morally weakening effects of cheating, a healthy strengthening of the moral fiber of the University may be envisioned and accomplished.

Cheating may be defined as including:

1. Obtaining help from another student during examination.
2. Knowingly giving help to another student during examination.
3. The use of notes, books, or any other unauthorized sources of information during examination.
4. Obtaining, without authorization, an examination or any parts thereof before taking the examination.
5. Submitting a report, notebook, speech, outline, theme, or other problem for credit that has been knowingly obtained or copied in whole or in part from another individual's academic composition, compilation, or other product.
6. Submitting or participating in the submission of a report or examination paper falsely represented as being the result of the original efforts of the submitting student. [Plagiarism is a serious offense in whatever form it may appear, be it in the submission of an entire article falsely represented as the student's own, in the inclusion within a piece of the student's writing or an idea for which the student has not provided sufficient documentation, or in the inclusion of a documented idea not sufficiently assimilated into the student's language and style. A student who has any questions about whether a particular inclusion in the student's work might constitute plagiarism should take the responsibility of requesting the aid and clarification of the instructor to whom the student is submitting the work.]
7. Altering the record of any grade in any gradebook, office, or other record.
8. Any other type of misconduct, offense, or manifestation of dishonesty or unfairness in or relating to academic work.

The deans of the several colleges and schools shall have the authority and shall be responsible for the handling of cheating cases arising or occurring within their respective colleges or schools.

Each member of the teaching faculty and all other University employees, including but not limited to assistants, proctors, office personnel, custodians and night watchmen, shall promptly report, via the department chairperson or immediate superior, if any, each known case of cheating, as hereinbefore defined, to the dean of the college or school concerned.

Each case of cheating shall be handled with dispatch, and the dean shall promptly report thereon in writing to the President and shall at the same time place a copy of such report in the permanent record of the student concerned and forward another copy thereof to the Dean of Student Educational Services for the student's permanent records. The report shall include a brief statement covering the facts and circumstances of the case and the discipline applied or recommended.

In cases wherein cheating occurs in a college or school other than that in which the student is registered, the minimum penalty, as prescribed in the paragraph below, shall be applied by the dean of the college or school in which the cheating occurred. In handling such cases the dean shall follow the procedure in the above paragraph and then immediately refer the case, by transmittal of a copy of the report thereon as prescribed in the above paragraph, to the dean of the college or school in which the student involved is registered. The purpose of this copy of the report is for information and for imposition or recommendation of such further discipline or penalty as may be warranted. Upon completion of a review of and action on the case, the dean of the college or school in which the student is registered shall thereupon compose an independent written report on the case and transmit same to the President and otherwise distribute copies thereof as provided in the above paragraph.

The deans and their respective teaching faculties shall take remedial and preventive steps to remove every opportunity for any situation conducive to cheating. Particular attention shall be given to the maintenance of a high level of proctoring in those colleges, schools, and departments wherein proctoring is employed and to security against student access to or knowledge of examination and test materials before the time of the intended use thereof for student examination and testing purposes. The deans shall exercise their independent discretion as to methods and means of accomplishing these ends and may employ therefor faculty meetings, written instructions, or other effective devices and measures.

The *minimum* penalty for all cases of cheating shall be dismissal from the course and the establishment of a grade of F in the course, as of the date of cheating, *unless in the opinion of the dean there are extenuating circumstances which might indicate the advisability of a lesser penalty.* Where the grade of F in the course involved is a part of the penalty for cheating, that grade is to be entered on the student's permanent record and to remain there even though the student withdraws from the course or from the University.

For a second or subsequent cheating offense, in addition to failure in the course, suspension or expulsion of the student shall be recommended by the dean for the President's action. The office of the Dean of Student Educational Services shall maintain its records of reports in cheating cases so as to detect and ascertain promptly and accurately the occurrence of second or subsequent cheating offenses and, upon inquiry by the dean, shall promptly advise whether the student has been guilty of any prior cheating offense or offenses.

Suspension or expulsion of a student guilty of cheating may, in first offense cases, be recommended by the dean to the President if the facts and circumstances of the case so warrant or the rules, regulations, or policy of the college or school concerned so require.

In cheating cases involving criminal offenses, such as theft of examination or test materials, alteration of records, breaking or entering buildings, offices, desks, safes, or filing cabinets, damage to public property and other like or similar misconduct, the academic penalties and discipline as herein prescribed shall be applied and in addition thereto the dean of the college or school con-

cerned shall, with the approval of the President, cause the facts of each case to be presented to the Prosecuting Attorney of Monongalia County, West Virginia, for further investigation and for prosecution by injunction or otherwise as may be warranted. Upon the issuance of a warrant for or the return of an indictment against a student on account of any such offense, the President shall suspend such student from the University pending final prosecution thereon. If the student be acquitted of the offense, the student's suspension may be vacated, but if convicted of the offense, the student shall be expelled from the University.

A student may appeal from the decision of action of a dean in a cheating case to the President for review and reconsideration and the President may thereupon affirm or reverse, in whole, or in part, the decision or action of the dean.

In action on any cheating case, whether on appeal by a student or on recommendation or reference by a dean, the President may consider the case record, may further investigate or cause to be investigated the facts and circumstances of the case, and may act personally thereon and dispose thereof, or the President may, in his discretion, refer the case to another appropriate University office, committee, or agency for review, investigation, consideration, and recommendation before final action thereon and disposition thereof.

It is recommended that, in all phases of cheating cases, care and caution be observed so as to avoid accusation or charge of cheating or related impropriety which may be without foundation. A false accusation may have serious implications and result in reflection on or harm to an innocent and unoffending student and discredit to the faculty.

Part 3

CURRICULA AND COURSES

Plan for Numbering Courses

For convenience, each course of study is designated by the name of the department in which it is given and by the number of that course. The plan for numbering is as follows:

Courses 1 to 99 — Courses intended primarily for freshmen and sophomores.

Courses 100 to 199 — Courses intended primarily for juniors and seniors.

Courses 200 to 299 — Courses for advanced undergraduate students and selected graduate students. No more than 40 percent of the credits counted for meeting requirements for a graduate degree can be at the 200 level.

Courses 300 to 399 — Courses for graduate students; students in professional programs leading to the doctorate; and selected, advanced undergraduates. Undergraduates in any class carrying a 300 course number should have a 3.0 cumulative grade-point average and have written approval on special forms from their instructor and adviser and the Graduate School Dean. Seniors within 12 semester hours of graduation may, with prior approval on special senior petition forms of their adviser and Graduate School Dean, enroll in 300-level graduate courses. (In summary, 200-level courses are intended primarily to serve undergraduate students; 300-level courses are intended primarily to serve introductory graduate and master's degree course needs.)

Courses 400 to 499 — Courses for graduate students only. All doctor's degree dissertation hours shall be awarded at the 400 level — specifically under course number 497.

Graduate degree credit hour requirements must include at least 60 percent at the 400 and 300 level.

Schedule of Courses

Before the opening of each semester, a *Schedule of Courses* is printed announcing the courses that will be offered by the colleges, schools, and divisions of WVU.

Descriptions of Courses

I	— a course given in the first semester
II	— a course given in the second semester
I, II	— a course given in each semester
I and II	— a course given throughout the year
Yr.	— a course continued through two semesters
S	— a course given in the summer session
hr.	— credit hours per course
rec.	— recitation period
lab.	— laboratory period
Conc:	— concurrent registration required
PR:	— prerequisite
consent	— consent of instructor required
CR	— credit but no grade

College of

Agriculture and Forestry

Robert S. Dunbar, Jr., Ph.D., *Dean of College of Agriculture and Forestry; Director of Agricultural Experiment Station; Professor of Animal Science.*
Alfred L. Barr, Ph.D., *Director of Division of Animal and Veterinary Sciences; Professor of Agricultural Economics.*
Homer C. Evans, Ph.D., *Associate Director of Agricultural Experiment Station; Associate Dean of the College of Agriculture and Forestry; Professor of Agricultural Economics.*
M. E. Gallegly, Ph.D., *Director of Division of Plant Sciences; Professor of Plant Pathology.*
K. D. McIntosh, Ph.D., *Director of Division of Resource Management; Professor of Agricultural Economics.*
David E. White, Ph.D., *Director of Division of Forestry; Professor of Forest Economics.*
Paul V. Armbrester, M.S., *Assistant to Dean for Academic Affairs; Assistant Professor of Agricultural Education.*
Edwin C. Townsend, Ph.D., *Assistant to Director for Research; Associate Professor of Statistics.*

The management, utilization, and conservation of our soils, water, forests, wildlife, domestic animals, crops for food and fiber, and protection of environmental quality require the efforts of large numbers of people with various levels of technical and formal education. These people are employed by industries, state and federal agencies, educational institutions, foundations, and association. Many are self-employed.

Students enrolling in the College of Agriculture and Forestry are offered a variety of alternative career fields. You may emphasize the biological sciences and the study of animals, plants, trees or soil; you may emphasize the social sciences related to resource management or recreation; or you may emphasize the artistic development of landscapes.

Agriculturists have long recognized that their field in a broad sense is applied ecology, which deals with the relationship of living organisms to their environment. The student of agriculture and forestry studies many different subjects concerned with plants, animals, and microbes as they interrelate with and affect our environment. The subject of ecology is interwoven throughout our courses and the student gains a comprehensive understanding of the basic elements at work in our environment. Thus, our graduates are capable of using sound judgment based on fact for the wise management of natural resources.

Degrees and Curricula

The college is divided into four administrative Divisions and the Agricultural Experiment Station. The College of Agriculture and Forestry offers five baccalaureate degrees and eleven curricula in which students may major. Those degrees and curricula are:

Bachelor of Science (B.S.)
- Animal & Veterinary Sciences Curriculum
- Resource Management Curriculum
- Wildlife Resources Curriculum

Bachelor of Science in Agriculture
- Animal Science Curriculum
- Plant and Soil Science Curriculum
- Resource Management Curriculum
- Agricultural Education Curriculum

Bachelor of Science in Forestry
- Forest Resources Management Curriculum
- Wood Industries Curriculum

Bachelor of Science in Landscape Architecture
- Landscape Architecture Curriculum

Bachelor of Science in Recreation
- Recreation Curriculum

The Agricultural Experiment Station, the statewide research unit in the College, has extensive land for research within a short distance of the Morgantown campuses. This land is divided into areas devoted to dairy, forestry, wildlife, livestock, poultry, horticulture, agronomy, and soils with facilities for classroom and laboratory work. Students and professors use these areas regularly for instruction and research dealing directly with academic studies. Information gathered at these Agricultural Experiment Station holdings is used to up-date subject matter in the classroom.

Branch experiment stations are maintained at key locations throughout the state. Four experiment farms containing a total of 1,770 acres are located at Kearneysville, Point Pleasant, Reedsville, and Wardensville. Four forest tracts containing 3,157 acres are located in Greenbrier, Raleigh, Randolph, and Wyoming counties.

Admission

Students may be considered for admission to WVU on the basis of graduation and transcripts from accredited high schools. High school graduates are required to present credit for 4 units of English and 1 unit of algebra. In addition, agriculture and forestry require 1 unit of geometry.

Students seeking admission to one of the curricula in Forestry must have earned 30 hours of college credit.

Complete information concerning WVU admission regulations, fees and expenses, etc., may be obtained in Part 2 of this *Catalog*.

College Regulations

Students in the College of Agriculture and Forestry must comply with University regulations dealing with scholarship. Specific regulations that apply to the College are described in the following sections.

Credit Load Per Semester

The minimum work per semester is 14 credit hours and the maximum work per semester is 20 hours. Exceptions to this regulation are:

A student in his first semester of enrollment may reduce his course load to 12 semester hours with the approval of his adviser.

An adviser may register a student as a part-time student if less than 14 hours are required to meet all requirements for the bachelor's degree.

Any exceptions to these regulations may be requested by petitioning the Committee on Academic Standards.

Student Petitions

Petitions may be submitted to the Committee on Academic Standards: (a) to register for more than maximum hours regularly allowed; (b) to register for less than minimum load; (c) to drop courses after the regular withdrawal date; (d) for reentry after scholastic suspension, and (e) to transfer into the College with a grade-point deficiency accumulated in another college.

Petitions should be prepared on special forms and must include the recommendation of the student's adviser.

Barring unusual and unforeseen circumstances, a student is under obligation to complete the courses in which registration was made. Low grades in a course do not constitute a reason for withdrawal.

Students may appear in person before the Committee on Academic Standards in support of their petitions.

Students may appeal decisions of their advisers, Academic Standards Committee, and Division Chairpersons to the Dean.

Students should submit petitions as soon as a problem becomes evident. Delay may result in lack of approval because of insufficient time for action.

Notice of the recommendation by the Committee on Academic Standards regarding a petition, after approval by the Dean, shall be sent to the student, to the adviser, and the Chairperson of the Division in order that the report can be filed with the student's scholastic records.

Add-Drop Procedure

A student may drop part of the class work during the first or second semester, at any time following registration until the end of the fifth week after the first day of classes. The student must have the adviser's approval only in this situation, provided the student does not fall below the College minimum for a full-time student.

In order to drop a course after the fifth week of classes and 18 days before the last day of classes (second week of longer summer session; first week of shorter summer session), students must submit a petition to drop a course.

The student will obtain an add-drop petition in the Dean's office and deliver it to the adviser properly completed and signed. The adviser will forward the petition (by mail) to the Chairperson of the Academic Standards Committee. The student will be notified by the Dean's office of the decision.

Grade-Point Deficiencies

Academic Warning

A student with a grade-point deficiency which is not so large as to cause suspension shall be placed on academic warning. The student shall be advised in writing of the student's academic status by the Dean. Copies of the letter shall be sent to the student's parent or guardian, the adviser, the Director, and the official file of the student.

A student with a grade-point deficiency shall not enroll for more than 15 hours.

Academic Probation

Students who have been reinstated after suspension and students who have transferred from another college with less than a 2.0 grade-point average shall be placed on academic probation until the grade-point deficiency is reduced to a level less than the maximum allowable without suspension. At such time the student will be reassigned to an adviser by the appropriate Division Chairperson.

While on academic probation a student shall be required to maintain a minimum grade-point average of 2.25 in order not to be suspended.

The Chairperson of the Committee on Academic Standards shall serve as adviser to all students on academic probation.

Academic Suspension

Any student whose grade-point deficiency exceeds the maximum allowed by these regulations shall be subject to suspension. The student shall be notified of suspension in writing by the Dean. Copies of the letter shall be sent to the Dean of Admissions and Records, Director of Residence Halls, the appropriate Division Chairperson, the student's parent or guardian, the adviser, and the official file of the student.

Any student on academic probation whose grade-point average at the end of a period of enrollment is less than 2.25 for that period of enrollment shall be suspended. Letters of notification shall be distributed as described above.

Students who have been suspended are advised to petition the Committee on Academic Standards after March 1 or October 1 to ascertain under what conditions, if any, they may be reinstated.

A student suspended for academic reasons who fails to gain readmission to the College of his choice shall, upon application, be readmitted after one calendar year from the date of suspension, as a Remedial Study student in the College of Arts and Sciences.

Agriculture

11. *Professions in Agriculture.* I. 1 hr. Survey of the subject-matter disciplines and of the career opportunities available to agriculture graduates. Study of all the dimensions of the industry of agriculture.

12. *Professions in Agriculture.* II. 1 hr. Continuation of Agr. 11.

90. *Man and Food.* I. 3 hr. Exploration on a global basis of the interactions between man and environment as reflected in food supply and in turn the development and maintenance of social and political institutions.

200. *Agriculture Travel Course.* S. 6 hr. Tour and study of production methods in major livestock and crop regions of the United States and other countries. Influence of population, climate, soil, topography, markets, labor, and other factors on agriculture production.

Agriculture and Forestry

190. *Professional Development.* I, II, S. 1 hr. per sem. PR: Cooperative education commitment. Evaluation of cooperative education experience in an independent work-study program.

Agricultural Biochemistry

Interdivisional Committee of Agricultural Biochemistry

David A. Stelzig, Ph.D. (N.D. St. U.) *Chairperson and Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

Bradford C. Bearce, Ph.D. (U. Calif.), *Associate Professor of Horticulture and Agricultural Biochemistry and Associate Horticulturist.*

James L. Brooks, Ph.D. (U. Calif.), *Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

L. Morris Ingle, Ph.D. (Purdue U.), *Associate Professor of Horticulture and Agricultural Biochemistry and Associate Horticulturist.*

Walter J. Kaczmarczyk, Ph.D. (Hahnemann Med. C.), *Associate Professor of Genetics and Agricultural Biochemistry and Associate Geneticist.*

George A. McLaren, Ph.D. (Okla. St. U.), *Professor of Nutritional Biochemistry and Agricultural Biochemist.*

William G. Martin, Ph.D. (WVU), *Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

Homer Patrick, Ph.D. (Penn. St. U.), *Professor of Agricultural Biochemistry and Agricultural Biochemist.*

Robert L. Reid, Ph.D. (Aberdeen U.), *Professor of Animal Nutrition and Agricultural Biochemistry and Nutritionist.*

Eion G. Scott, Ph.D. (U. Calif.), *Professor of Horticulture and Agricultural Biochemistry and Chairperson of Horticulture and Horticulturist.*

Valentin Ulrich, Ph.D. (Rutgers U.), *Professor of Genetics and Agricultural Biochemistry and Geneticist.*

Agricultural Biochemistry

Agr. Biochem.

180. *Assigned Topics.* I, II. 1-4 hr. In order to be eligible to register in Assigned Topics, the student must: (1) be in good standing, and (2) obtain approval of the Division before registration.

210. *Introductory Biochemistry.* I, II. 3 hr. PR: Two semesters of general chemistry and one semester of organic chemistry. The biochemistry of the proteins, carbohydrates, lipids, nucleic acids, enzymes, coenzymes, and cellular metabolism in plants and animals.

212. *Animal Biochemistry.* II. 3 hr. PR: One semester of biochemistry. Nutritional and physiological chemistry of domestic animals.

213. *Introductory Biochemistry Laboratory.* II. 2 hr. PR or Conc.: Agr. Biochem. 210. A laboratory course in nutritional biochemistry.

310. *General Biochemistry.* I. 3 hr. PR: 8 hr. Organic chemistry. A general course in biochemistry primarily intended to meet the needs of graduate students.

311. *Laboratory Experiments in Biochemistry.* I. 2 hr. PR or Conc.: Agr. Biochem. 310. Experiments to demonstrate some of the basic tools and procedures of biochemical research.

312. *General Biochemistry.* II. 3 hr. PR: Agr. Biochem. 310 or consent. Continuation of Agr. Biochem. 310.

313. *Advanced Biochemistry Laboratory.* II. 2 hr. PR or Conc.: Agr. Biochem. 311, 312. Application of modern biochemical techniques to experimentation in animal and plant metabolism.

314. *Radionuclide Biochemistry.* II. 3 hr. PR: Chem. 1, 2, 131, or consent. Radionuclide methods and isotope handling as needed by students interested in biological research.

Division of Animal and Veterinary Sciences

Faculty

Alfred L. Barr, Ph.D. (Okla. St. U.), *Chairperson, Division of Animal and Veterinary Sciences and Professor of Agricultural Economics and Agricultural Economist.*

O. J. Abbott, Ph.D. (U. Wisc.), *Professor of Poultry Science and Poultry Scientist.*

Gerald C. Anderson, Ph.D. (U. Mo.), *Professor of Animal Science and Animal Husbandman.*

C. J. Cunningham, Sr., B.S. (VPI), *Professor of Animal Science; Animal Husbandman in Charge, Reymann Memorial Farms, Wardensville.*

Leslie Dozsa, D.V.M. (C. Vet. Med., Budapest), *Professor of Veterinary Science and Animal Pathologist.*

Robert S. Dunbar, Jr., Ph.D. (Cornell U.), *Professor of Animal Science and Dean of College of Agriculture and Forestry.*

Joseph C. Emch, M.S. (Okla. St. U.), *Associate Professor and State Extension Specialist — Animal Science.*

Rush C. Hatch, B.S. (WVU), *Dairy Farm Superintendent.*

James O. Heishman, B.V.Sc., V.S. (U. Toronto), *Associate Professor and Associate Animal Pathologist, Reymann Memorial Farms, Wardensville.*

Donald J. Horvath, Ph.D. (Cornell U.), *Professor of Animal Science and Animal Husbandman.*

E. Keith Inskeep, Ph.D. (U. Wisc.), *Professor of Animal Science and Animal Scientist.*

William T. Jones, M.S. (WVU), *Poultry Farm Superintendent.*

Robert O. Kelley, Ph.D. (U. Mo.), Associate Professor and State Extension Specialist — Dairy Science.

Harold E. Kidder, Ph.D. (U. Wisc.), *Professor of Animal Science and Animal Husbandman.*

Edwin A. Linger, B.S. (WVU), *Instructor and Livestock Farm Superintendent.*

Marvin R. McClung, Ph.D. (Iowa St. U.), *Professor of Animal Science and Animal Scientist.*

Dean L. McIlroy, Jr., Ph.D. (Cornell U.), *Professor of Animal Science and Animal Scientist.*

George A. McLaren, Ph.D. (Okla. St. U.), *Professor of Nutritional Biochemistry and Agricultural Biochemist.*

William G. Martin, Ph.D. (WVU), *Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

Byron W. Moore, M.S. (WVU), *Associate Professor and State Extension Specialist — Poultry Science.*

Norman O. Olson, D.V.M. (Wash. St. U.), *Professor of Veterinary Science and Veterinarian.*

Homer Patrick, Ph.D. (Penn. St. U.), *Professor of Agricultural Biochemistry and Agricultural Biochemist.*

John B. Peters, Ph.D. (U. Wisc.), *Associate Professor of Animal Science and Associate Animal Scientist.*

Ronald A. Peterson, Ph.D. (Mich. St. U.), *Associate Professor of Poultry Science and Associate Poultry Scientist.*

Stephen Powell, M.S. (Purdue U.), *Instructor in Meat Science and Research Assistant.*

Robert L. Reid, Ph.D. (Aberdeen U.), *Professor of Animal Science and Nutritionist.*

John H. Rietz, D.V.M. (Ohio St. U.), *Professor Emeritus of Veterinary Science and Animal Pathology.*

John R. Schabinger, Ph.D. (N.C. St. U.), *Professor and Area Extension Specialist — Dairy Science.*

Paul M. Smith, M.S. (Penn. St. U.), *Instructor in Dairy Science and Supervisor of Dairy Processing.*

William V. Thayne, Ph.D. (U. Ill.), *Assistant Professor of Dairy Science and Assistant Dairy Scientist.*

Roy O. Thomas, Ph.D. (Mich. St. U.), *Associate Professor of Dairy Science and Dairy Scientist.*

A. H. VanLandingham, Ph.D. (WVU), *Professor Emeritus of Agricultural Biochemistry.*

Benjamin W. Wamsley, Jr., M.S. (WVU), *Associate Professor and State Extension Specialist — Animal Science.*

James A. Welch, Ph.D. (U. Ill.), *Professor of Animal Science and Animal Husbandman.*

Frank E. Woodson, D.V.M. (Ohio St. U.), *Associate Professor of Veterinary Science.*

Programs of Study

Students taking programs in this Division may work towards degrees which enable them to do graduate work, go into commercial agriculture, work for federal or state agencies, the food processing industry, and other areas of food and agriculture. The program in Pre-Veterinary Medicine provides requirements for entry into veterinary colleges. Many pre-veterinary students obtain their bachelor degrees along with meeting veterinary school requirements.

Students taking programs in the Division will take courses in breeding, nutrition, pathology, food science, and animal production. To assist in equipping themselves for the many varied careers in animal agriculture, students take supporting courses in other divisions of the College of Agriculture and Forestry and in other colleges. These include courses such as agricultural biochemistry, mathematics, chemistry, biology, finance, business law, and accounting. The programs are flexible enough to permit the student to obtain a broad background and take enough courses in an area the last two years to prepare for the first job.

Bachelor of Science

ANIMAL AND VETERINARY SCIENCES CURRICULUM

The curriculum in science, with its flexible design, will provide the student with the opportunity to acquire the necessary background in agricultural biochemistry, mathematics, chemistry, physics, and modern concepts of biology in preparation for professional or graduate study in such fields as agricultural biochemistry, animal breeding, animal physiology, nutrition, and pathology. Selection of individual courses is the responsibility of the student in consultation with an adviser. The student must complete a minimum of two courses each in biology, chemistry, and physics, and must complete mathematics through calculus. The pre-professional student may substitute chemistry for calculus to meet degree requirements.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with WVU English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	40
(A minimum of two courses in each of biology, chemistry, physics, and mathematics through calculus is required. The pre-professional student may substitute advanced chemistry courses for calculus to meet degree requirements. This ordinarily means a minimum of 12 hours of chemistry in addition to the required courses. The 40 hours of natural sciences are exclusive of the courses offered in the College of Agriculture and Forestry.)	
Courses in the College of Agriculture and Forestry	24
Physical Education	2
Free Electives	32
Total	128

Bachelor of Science in Agriculture

ANIMAL SCIENCE CURRICULUM

The curriculum of Bachelor of Science in Agriculture will provide the student with the opportunity to acquire the necessary background in biochemistry, nutrition, breeding, physiology, pathology, agricultural economics, and agronomy to become prepared for a career in animal, dairy, or poultry production and management. There also are food science courses available under the curriculum for those students who are interested in preparing for opportunities in food processing related to dairy, poultry, and meat products.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	24
(Must elect a minimum of 8 credits in biology; 8 credits in chemistry; 3 credits in college algebra or equivalent, exclusive of courses offered in agriculture and forestry.)	
Courses in Agriculture	45
Elect a minimum of 3 credits in each of the following:	
1. Animal Science 3. Soil Science	
2. Plant Science 4. Agricultural Economics	
Elect additional courses to obtain a total of 45 credits in Agriculture.	
Physical Education	2
Free Electives	35
Total	136

Courses of Instruction

Animal and Veterinary Science

51. *Principles of Animal Science.* I. 4 hr. A comparative study of the production of meat, milk, eggs, and wool. Nutrition, physiology, genetics, hygiene, physical environment, and economics are discussed as bases for sound managerial decisions.

180. *Assigned Topics.* I, II, S. 1-4 hr. per. sem. In order to be eligible to register in Assigned Topics 180, the student must: (1) be in good standing, and (2) obtain approval of the Division before registration.

195. *Seminar.* II. 1 hr. Senior seminar.

Pre-Veterinary Medicine Program

This program is designed to provide students with the academic requirements for entry into professional schools or colleges of veterinary medicine. West Virginia has agreements with Ohio State University and with the Southern Regional Education Board whereby each year up to six students may be accepted by Ohio State University and up to six may be placed in the Southern Regional Education Board. In order to qualify for these positions the students must have been West Virginia residents for at least the past five years. Students may apply to any of the other veterinary schools in the United States and Canada for admission.

Applicants for admission to these colleges of veterinary medicine must present at least 60 semester hours of acceptable credit. Since a maximum of twelve eligible students are accepted each year, alternate goals in either of the other degree programs are urged for all pre-professional students.

Applicants with a grade-point average of 3.0 or above will be given first consideration for admission to these institutions.

A student who has completed 90 hours of course work at WVU, or 90 hours at institutions within the West Virginia state system of higher education, including at least 36 at WVU, and has completed all required courses for the degree may transfer credit from a veterinary college to WVU and receive his bachelor's degree.

The *equivalent* of the following pre-professional courses is required of all applicants for admission without condition to a college of veterinary medicine.

Curriculum Requirements	*Hours*
Agricultural Orientation	2
English	6
Chemistry (Inorganic)	8
Chemistry (Organic)	8
Biology	8
Principles of Heredity	4
Mathematics	3
Physics	8
(The physics courses required at Ohio State University have a prerequisite of trigonometry. Thus trigonometry is required for the student planning to attend Ohio State University.)	
Speech, Humanities, and Social Science	12
Electives	9
Total	68

Animal Nutrition

An. Nutr.

101. *Animal Nutrition.* I, II. 3 hr. PR: Two courses in chemistry. Digestion and metabolism of food nutrients, nutrient requirements of farm animals, and nutritive values of feeds and rations.

294. *Poultry Nutrition.* II. 3 hr. PR: An. Nutr. 101. Nutritional requirements, interrelationships, and deficiencies of all types of domesticated fowl.

301. *Principles of Nutrition and Metabolism.* I. 3 hr. PR: Agr. Biochem. 210, An. Physiol. & Br. 100 or equiv. A basic course in animal nutrition.

305. *Comparative Nutrition and Metabolism.* II. 3 hr. PR: An. Nutr. 301 or consent. A comparative study of the utilization of dietary nutrients by species of laboratory and domestic animals and man. (Offered in Spring of odd years.)

306. *Nutrition Laboratory Methods.* II. 3 hr. PR or Conc.: An. Nutr. 301 or consent. Chemical, physical, and biological methods used in animal nutrition research.

Animal Physiology and Breeding

An. Physiol. & Br.

100. *Introduction to the Physiology of Domestic Animals.* I. 3 hr. PR: Biol. 1 or consent. The function and regulation of the principal systems of the animal body.

204. *Animal Physiology Laboratory.* I. 2 hr. PR or Conc.: An. Physiol. & Br. 100. Laboratory study of the physiological systems of animals and the influences of environment on these systems.

225. *Physiology of Reproduction.* II. 3 hr. PR: Course in biology. Comparative physiology of reproduction in higher animals; endocrine functions involved in reproduction; genetic and environmental variations in fertility mechanisms.

226. *Breeding of Farm Animals.* I. 3 hr. PR: Course in genetics or consent. Application of principles of quantitative genetics to the improvement of farm animals.

280. *Behavioral Patterns of Domestic Animals.* II. 3 hr. (1 lab.). Examination of the bases for an exhibition and control of behavioral patterns of domestic animals.

NOTE: Students also are referred to Biol. 266 and 267.

Animal Production

An. Prod.

108. *Animal Production Experience.* I, II, S. 1 hr. (3 hr. lab.). A maximum of 4 credit hours may be earned by enrolling in this course. Experience in operating a poultry, dairy, or livestock farm, including trapnesting, incubation, and pedigreeing poultry; feeding, handling, calving, lambing, or farrowing of dairy and beef cows, sheep, and hogs.

137.* *Dairy Cattle History and Selection.* II. 3 hr. (2 labs.). To familiarize the student with the history, development, and programs of the breeds of dairy cattle as well as the modern concepts in phenotype and performance record evaluation.

138.* *Grading and Selection of Meat and Meat Animals.* II. 3 hr. (2 labs.). Appraisal of live meat animals, carcasses and cuts; evaluation of scientific techniques used in selecting meat animals and evaluating carcass meat.

139.* *Selection, Evaluation, and Grading of Meat Animals, Carcasses, and Cuts.* I. 2 or 4 hr. PR: An. Prod. 138 and consent. Evaluation of breeding merit and potential carcass characteristics of red meat animals; evaluation of meat quality and other

*Transportation for required trips in connection with these courses will generally be supplied by the College of Agriculture and Forestry. Students will be responsible for their meals and lodging.

factors affecting the marketability of meat. Tours of representative flocks, herds, and packing plants will be required.

141.* *Beef Production.* I. 3 hr. (1 lab.). PR: An. Nutr. 101. Physiological and economical bases of beef production.

142.* *Pork Production.* II. 3 hr. (1 lab.). PR: An. Nutr. 101. Physiological and economical bases of pork production. (Offered in Spring of even years.)

144. *Light Horse Science.* II. 3 hr. (1 lab.). The application of breeding, nutrition, physiology, and pathology to production and management of light horses.

145. *Milk Production.* II. 3 hr. (1 lab.). Feeding and management of dairy cattle.

146. *Sheep Production.* II. 3 hr. (1 lab.). PR: An. Nutr. 101. Physiological and economical bases of sheep production. (Offered in Spring of odd years.)

240. *Advanced Poultry Production.* I. 3 hr. (1 lab.). PR: Course in animal nutrition. Special phases of broiler and egg production, disease control, laborsaving studies, and recent designs in building and heating equipment for all types of poultry. (Offered in Fall of even years.)

250. *Current Literature in Animal Science.* I. 3 hr. PR: An. Nutr. 101. Evaluation of current research in animal science and its application to production and management.

Food Science

Food Sci.

106. *Poultry Products Technology.* I. 2 hr. (1 lab.). To familiarize the student with poultry and egg grades, and factors and conditions that determine and influence the quality of poultry products. (Offered in Fall of odd years.)

107. *Milk and Public Health.* I. 3 hr. (1 lab.). Food value of milk and its production and processing in relation to public health. (Offered in Fall of odd years.)

112. *Dairy Technology.* II. 3 hr. (1 lab.). Introductory. Composition and properties of milk and milk products; butterfat testing; manufacture of dairy products. (Offered in Spring of odd years.)

130. *Market Milk Products and Frozen Desserts.* I. 4 hr. (1 lab.). Assembling, processing, packaging, storing and merchandising dairy products. (Offered in Fall of even years.)

134. *Judging Dairy Products.* II. 2 hr. (2 labs.). A laboratory course in evaluating and judging dairy products.

167.* *Meats.* I. 3 hr. (2 labs.). Processing, curing, and care of meats. Visit to one of the large packing houses of Pittsburgh required.

267.* *Advanced Meats.* II. 3 hr. (2 labs.). PR: Food Sci. 167. Composition of meat, fabrication of meat animal carcasses, factors influencing yield, physiology and chemistry of pertinent phenomena, and meat merchandising. (Offered in Spring of even years.)

Veterinary Science

102. *Animal Pathology.* II. 3 hr. Diseases of domestic animals, with special emphasis on the common diseases.

210. *Principles of Laboratory Animal Science.* I. 3 hr. (1 lab.). PR: Consent for undergraduates. The management, genetics, physiology, nutrition, disease, and germ-free quartering of common laboratory animals.

*Transportation for required trips in connection with these courses will generally be supplied by the College of Agriculture and Forestry. Students will be responsible for their meals and lodging.

301. *Surgery.* (Same as Surg. 301.) I. 3 hr. (1 lab.). Introduction to laboratory animal experimentation.

306. *Parasitology.* II. 3 hr. PR: Course in biology. Common parasites of farm animals, their control, and their effect upon the host. (Offered in Spring of odd years.)

Division of Forestry

Faculty

David E. White, Ph.D. (SUNY), *Chairperson, Division of Forestry and Professor of Forest Economics.*
Van F. Anderson, M.S. (WVU), *Lecturer in Recreation.*
George H. Breiding, B.S. (Ohio St. U.), *State Extension Program Leader — Outdoor Recreation and Assistant Professor of Forestry.*
Samuel M. Brock, Ph.D. (U. Minn.), *Professor of Forest Economics.*
Maurice G. Brooks, M.S. (WVU), *Professor Emeritus of Wildlife Management.*
Kenneth L. Carvell, D.For. (Duke U.), *Professor of Silviculture and Silviculturist.*
Franklin C. Cech, Ph.D. (Tex. A&M U.), *Professor of Genetics and Forest Geneticist.*
John D. Gill, M.S. (Mich. St. U.), *Assistant Professor of Wildlife Management. (Wildlife Biologist, U. S. Forest Service Forestry Sciences Laboratory.)*
Allen W. Goodspeed, M.F. (Yale U.), *Professor Emeritus of Forest Management.*
William N. Grafton, M.S.F. (WVU), *Assistant Professor and Area Extension Specialist — Forestry.*
Carter S. Hall, M.B.A. (WVU), *State Extension Specialist — Forest Industries and Assistant Professor. (On leave of absence.)*
John R. Hamilton, Ph.D. (N.D. St. U.), *Professor of Wood Science and Wood Scientist.*
William M. Healy, B.S. (Penn. St. U.), *Instructor in Wildlife Management. (Wildlife Biologist, U. S. Forest Service Forestry Science Laboratory.)*
Joseph M. Hutchison, Jr., M.S. (WVU), *Associate Professor of Recreation.*
Norman D. Jackson, M.W.T. (N.C. St. U.), *Assistant to the Director, Associate Professor of Wood Science and Associate Wood Scientist.*
Etley P. Jenkins, M.S. (WVU), *Assistant Professor of Wood Science and Assistant Wood Scientist.*
Nils J. Johnson, M.S.F. (U. N. Hamp.), *Instructor in Forest Hydrology. (Hydrologist, U. S. Forest Service Forestry Sciences Laboratory.)*
Laszlo O. Keresztesy, Ph.D. (U. London), *Research Associate in Wood Science and Associate Professor of Civil Engineering.*
William E. Kidd, Jr., M.S. (VPI), *State Extension Specialist, Forest Management, and Associate Professor.*
Christian B. Koch, Ph.D. (U. Mich.), *Professor of Wood Science and Wood Scientist.*
Richard Lee, Ph.D. (Colo. St. U.), *Professor of Forest Hydrology and Forest Hydrologist.*
William R. Maxey, M.S.F. (WVU), *Assistant Professor of Forest Management and Forest Manager.*
Edwin D. Michael, Ph.D. (Tex. A&M U.), *Associate Professor of Wildlife Management and Associate Wildlife Biologist.*
Thomas A. More, Ph.D. (U. Mich.), *Assistant Professor of Recreation.*
W. Clement Percival, Ph.D. (SUNY), *Professor Emeritus.*

David E. Samuel, Ph.D. (WVU), *Assistant Professor of Wildlife Management and Assistant Wildlife Biologist.*
H. Reed Sanderson, M.S. (Colo. St. U.), *Assistant Professor of Wildlife Management. (Wildlife Biologist, U. S. Forest Service Forestry Sciences Laboratory.)*
William M. Santonas, B.S. (Ohio U.), *Instructor in Wildlife Management. (Supervisor of Resources Planning, West Virginia Department of Natural Resources.)*
Bruce A. Schick, Ph.D. (SUNY), *Assistant Professor of Forest Economics and Assistant Forest Economist.*
Robert L. Smith, Ph.D. (Cornell U.), *Professor of Wildlife Management and Wildlife Biologist.*
Susan C. Smith, B.S.Rec. (WVU), *Instructor in Recreation and Assistant in Recreation.*
Hans-Peter Steinhagen, Diplo-Holzwirt (U. Hamburg), *Assistant Professor of Wood Science and Assistant Wood Scientist.*
Anthony C. Tomkowski, M.S. (WVU), *Instructor in Forestry.*
George R. Trimble, Jr., B.S.F. (U. Me.), *Assistant Professor of Forest Management. (Project Leader, Timber Management Research, U. S. Forest Service, Parsons Timber and Watershed Laboratory.)*
Earl H. Tryon, Ph.D. (Yale U.), *Professor of Silviculture and Silviculturist.*
Ben W. Twight, Ph.D. (U. Wash.), *Assistant Professor of Forest Recreation.*
Harry V. Wiant, Ph.D. (Yale U.), *Professor of Forestry and Forester.*
William L. Wylie, M.S. (WVU), *Assistant Professor of Forest Recreation.*
Vern P. Yerkes, M.S.F. (Ore. St. U.), *Instructor. (Forest Products Technologist.)*
Joseph N. Yeager, M.S. (WVU), *Instructor in Forestry and Area Extension Specialists — Forestry.*
Gary W. Zinn, Ph.D. (SUNY), *Assistant Professor of Forest Management.*

Programs of Study

The Division of Forestry offers curriculums in Forest Resources Management, Wood Industries, Recreation and Parks Management, and Wildlife Resources. The first two curriculums lead to the degree of Bachelor of Science in Forestry (B.S.F.); the curriculum in Recreation and Parks Management leads to the degree of Bachelor of Science in Recreation (B.S.R.); the Wildlife Resources curriculum leads to the degree of Bachelor of Science (B.S.).

Entrance Requirements

Students who wish to major in one of the Forestry programs must have completed 30 hours of college credit and must have attained at least a 2.0 grade-point average (2.25 in Recreation and Parks Management and Wildlife Resources). The 30 hours of entrance credit may be earned at any institution of higher learning. Specific subjects to be included within the 30 hours are listed in the description of each curriculum. Students enrolling at WVU as freshmen and who wish to gain admission to one of the programs in the Division of Forestry will ordinarily enroll in a year's program of general studies in the College of Arts and Sciences.

Bachelor of Science in Forestry

FOREST RESOURCES MANAGEMENT CURRICULUM

Students who major in Forest Resources Management take a course of study of 138 credit hours, at least 33 of these hours consisting of courses in one of three areas of emphasis: forest biology and ecology, administration and control of

forest resources, or the social context of forestry. With the growing demand for forest products and the increasing public consciousness of the value of wildland for recreation, watershed protection, and aesthetics, career opportunities for professionals educated in the scientific management of timber resources are expanding. Graduates in this field have a wide range of employment alternatives, including federal and state agencies and private industry.

Students who wish to major in Forest Resources Management must have earned at least 30 hours of college credit with a grade-point average of 2.0 or better. The 30 hours must include 6 hours of English, 8 hours of chemistry (Chem. 15 and 16 or equiv.), 8 hours of biology, and 6 hours of mathematics through college algebra and trigonometry. The student is encouraged to fulfill the University requirement of 2 hours of physical education during the first year.

Curriculum Requirements	*Hours*
Entrance	30
Biology 51, 52	3
Economics 54	3
Mathematics 15	4
Statistics 101 or equivalent	3
Civil Engineering 5	4
Forest Management 12, 100, 101, 122, 151, 211, 230, 233, 234	28
Wood Science 121	3
Core electives	18
Communication elective	3
Restricted electives	33
Free electives	6
Total	138

Restricted Electives and Subject Areas

The student must complete a minimum of 33 hours in the three subject areas shown below. At least 5 credit hours must be chosen from each subject area. No course may be used to satisfy both subject area and University Core Curriculum requirements. Restricted electives will be chosen according to the goals of the student and with the adviser's consent. The courses listed under each subject area heading is not inclusive of all courses which might be legitimate electives in that subject area.

Subject Area I — Forest Biology and Ecology
- Agronomy 10, 115, 210, 230
- Biology 103, 151, 169
- Entomology 152
- Forestry 218, 219
- Forest Management 213, 215, 216
- Plant Pathology 153
- Wildlife Management 131

Subject Area II — Administration and Control of Forest Resources
- Accounting 51
- Civil Engineering 6
- Computer Science 1
- Finance 161
- Forest Engineering 291
- Forestry 226

Forest Management 222, 232
Mathematics 16
Recreation and Parks 233
Statistics 201, 215, 231
Wood Science 130, 234

Subject Area III — Social Context of Forestry
Agricultural Economics 200
Business Law 111
Economics 55, 130, 160, 211
Forestry 220, 233
Management 105
Political Science 140, 234
Psychology 164
Sociology 71

Bachelor of Science in Forestry

WOOD INDUSTRIES CURRICULUM

Wood Industries majors take a course of study of 138 credit hours with emphasis in management, production, or science. Graduates are sought by manufacturers of lumber, veneer, plywood, pulp and paper, and other wood products. Other opportunities exist with wood-using industries such as railroads, public utilities, and construction firms.

Students who wish to major in Wood Industries must have earned at least 30 hours of college credit with a grade-point average of 2.0 or better. The 30 hours must include 6 hours of English, 8 hours of chemistry (Chem. 11 and 12 or equiv.), 8 hours of biology, and 6 hours of mathematics through college algebra and trigonometry. The student is encouraged to fulfill the University requirement of 2 hours of physical education during the first year.

Curriculum Requirements	*Hours*
Entrance	30
Biology 51, 52	3
Economics 54, 55	6
Mathematics 15	4
Physics 1	4
Forest Management 12, 100, 122, 211, 233	17
Wood Science 100, 123, 132, 134, 141, 240	17
Core electives	18
Restricted electives	39
Total	138

Restricted Electives and Areas of Emphasis

Part of the 39 hours of restricted electives can be selected by the student, with the adviser's consent, according to the student's interest. However, the student must select one of the following three areas of emphasis and take all those courses listed under that area.

Management

Requirement	*Hours*
Accounting 51, 52	6
Management 111	3

Marketing 111	3
Finance 111	3

Production

Requirement	*Hours*
Industrial Engineering 140	3
Wood Science 231, 232, 234, 251	12

Science

Requirement	*Hours*
Chemistry 133, 135	4
Mathematics 16	4
Physics 2	4
Mechanical Engineering and Mechanics 51, 52	8

Bachelor of Science in Recreation

RECREATION AND PARKS MANAGEMENT CURRICULUM

The Recreation and Parks Management curriculum consist of 134 hours and is designed to prepare students for a wide variety of professional recreation responsibilities in governmental agencies, private industry, schools, churches, public housing, hospitals, and other agencies serving a society which has become increasingly aware of appropriate use of leisure time. As our society continues to use its scientific knowledge in development of its natural and cultural resources, recreation will become more important as a social concern.

Students must have earned at least 30 hours of college credit with a grade-point average of 2.25 or better. The 30 hours must include 6 hours of English, 8 hours of biology, 6 hours of mathematics (college algebra, trigonometry, calculus, finite math, or statistics), and 3 of economics, psychology, and sociology. The student is encouraged to fulfill the University requirement of 2 hours of physical education in the first year.

Curriculum Requirements	*Hours*
Entrance	30
Recreation and Parks 43, 44, 202, 233 or 235, 265, 272	19
Core electives	15
Restricted electives	55
Free electives	15
Total	134

Restricted Electives and Areas of Emphasis

The program of study provides for three areas of emphasis: Administration, Interpretation, and Program Leadership. The student, with the adviser's consent, takes restricted elective courses which will contribute to his proficiency in one of the three areas.

Recreation Administration

Emphasis is on the sciences and arts essential to administration of recreation centers, areas, and systems. There is sufficient flexilibity to permit students to emphasize either urban and regional recreation administration or wildland recreation management. Students will take courses in such fields as management, economics, political science, psychology, sociology, forestry, resource management, and others which contribute to their understanding of decision-making.

Interpretation (Interpretive Naturalist)

The interpretive specialist needs a strong foundation in the sciences and arts, human behavior, and the technical skills necessary for the preparation and presentation of interpretive materials. Restricted electives in this area of emphasis will include courses in such fields as biology, communication, forestry, geology, history, and wildlife management. The principal employing agencies are the National Park Service, U. S. Forest Service, state and local recreation and parks departments, school systems, and private recreation enterprises.

Program Leadership

Emphasis is on the knowledge and skills required for the planning, development, and operation of recreation programs. Recommended for those persons who are especially interested in working closely with the users of recreation services in community agencies, recreation centers, youth serving organizations, and tourism centers serving transient populations. Students will take restricted electives spanning all forms of recreation including performing and applied arts, sports, and outdoor recreation. The academic agenda is sufficiently flexible to permit further specialization for working with special groups such as the ill, the handicapped, the aged, and the institutionalized.

Bachelor of Science

WILDLIFE RESOURCES CURRICULUM

Wildlife Resources majors take a program of study of 136 hours in preparation for professional positions as game and fish biologist, wildlife manager, planner of wildlife conservation programs, or specialist in communicating with the public regarding wildlife. The program usually leads to employment with a public agency, and in a wide range of positions because of the breadth of the graduate's background in ecology.

Thirty hours of college credit with a grade-point average of 2.25 or better is required for admission to the program. The 30 hours must include 6 hours of English, 8 hours of chemistry (Chem. 15 or 16 or equiv.), 8 hours of biology, and 6 hours of mathematics through college algebra and trigonometry. The student is encouraged to fulfill the University requirement of 2 hours of physical education in the first year.

Curriculum Requirements	*Hours*
Entrance	30
Chemistry 131	4
Mathematics 15	4
Economics 54	3
Computer Science 1	3
Geology 1	3
Speech Communication 11, 14	3
Statistics 101	3
Genetics 171	4
Political Science	3
Animal Physiology 100	3
Wildlife Management 213, 224, 231,* 234*	13
Core electives	15
Restricted electives	32
Free electives	13
Total	136

*Students interested in fisheries will take limnology, ichthyology, or other approved courses in aquatic ecology in lieu of W.M. 231 and 234.

Restricted Electives and Areas of Emphasis

The wildlife resources program provides for five areas of emphasized study: wildlife science, wildlife management, fisheries science, communications, and planning. The student, consulting with his adviser in the selection of courses, will use the restricted elective hours so as to provide appropriate background in the area chosen for emphasis.

Summer Field Studies

The six-week Forest Resources Management Summer Field Practice (F.M. 100 and 101) consists of two consecutive three-week sessions, and is designed for students who have completed the junior year of the Forest Resources Management curriculum. Students live in Morgantown in University or privately owned housing, and travel to the University Forest daily for field studies. The program provides training in forest surveying, timber estimating, photo interpretation, forest management, and forest recreation. Occasional trips are made to wood-using industries and to other forests to study the management of northern hardwood and spruce types. The Summer Field Practice culminates in a one-week trip to North Carolina where silvicultural and management activities are observed in the Southern Pine Region.

The instructional program in the five-week Wood Industry Field Practice (F.M. 100 and W.S. 100) consists of a three-week field course in surveying and mensuration followed by a two-week trip to Virginia and North Carolina to observe various commercial wood-using industries. These industries include: lumber, plywood, veneer, particle board, furniture, glue lamination, and preservation. The two-week trip, which is Wood Science 100, is offered in the summer of odd years.

A Recreation Internship (Recreation and Parks 202) is required of students who have completed the sophomore year of the Recreation Resources Management curriculum. Eight weeks of full-time, supervised professional field work is required of students who have completed the junior year of the recreation curriculum. The summer experiences acquaint students with management of park and recreation enterprises.

For resident students the tuition is $9.00 per credit hour; for nonresidents the tuition is $41.25 per credit hour. A $30.00 laboratory fee is charged. These must be paid to the University Comptroller at time of registration. Other expenses include lodging and meals for courses in which travel is involved.

Transfer Credits for Professional Courses

Students transferring to the Division of Forestry from one- or two-year technical schools or from four-year unaccredited forestry schools must take an advanced standing examination to demonstrate proficiency for any professional course offered by the Division of Forestry for which transfer credit is sought. This rule also applies to courses in dendrology and surveying. Advanced standing examinations are given after the student is enrolled in the Division of Forestry. All other credits are accepted subject to the regulations of the Office of Admissions and Records regarding transfer of credits.

Forest Engineering

Students interested in engineering problems associated with soil and water conservation and harvesting, handling, and transporting primary forest products might consider a career in Forest Engineering offered by the College of Engineering. The curriculum includes some courses in the biological and forestry sciences, and is sufficiently broad to permit the graduates to select from a wide variety of employment opportunities in one of the nation's largest industries. The Forest Engineering Curriculum is in the College of Engineering.

Courses of Instruction

Forestry

For.

1. *Professional Orientation.* I. 1 hr. (Required only for students who rank as freshmen in forestry.) Survey of degree options in the Division of Forestry and related career and professional opportunities.

3, 4. *Forestry Convocation.* I and II. No credit. All students are expected to attend the weekly convocation. Attendance is required of students during their first two semesters in forestry. Speakers and timely topics in forestry and allied fields are presented.

140. *West Virginia's Natural Resources.* I, II, S. 3 hr. Survey of policies and practices in development and use of soil, water, forest, wildlife, mineral and human resources in West Virginia.

170. *Problems in Forestry, Wood Science, Wildlife, or Recreation.* I, II, S. 1-4 hr. PR: Forestry senior or consent.

175. *Independent Study.* I, II, S. 1-4 hr. (4 hr. max.). PR: Forestry major or consent. Self-directed analysis of some aspect of natural resource use, recreation, ecology, or environmental pollution. Emphasis is on self-learning, including selection and delineation of a topic, self-disciplined study, and a creative approach to communicating what has been learned.

218. *Forest Water Quality.* I. 2 hr. PR: Forestry major or consent. Influences of natural forest cover, forest land uses, and harvesting practices on selected water quality parameters. Laboratory sessions demonstrate forest water pollution detection and prevention techniques.

219. *Forest Hydrology.* II. 3 hr. PR: Consent. Description and quantitative treatment of the hydrologic cycle in nature, with primary emphasis on the role of forests and topography.

220. *Forest Policy and Administration.* II. 3 hr. PR: Upperclass forestry major or consent. Forest policy in the United States; important federal and state laws; administration of public and private forests; problems in multiple-use forestry.

226. *Remote Sensing of Environment.* II. 2 hr. PR: Math. 3, 4. Measurement and interpretation of natural resources and environment from photography, radar, infrared, and microwave imagery.

233. *Principles of Industrial Forestry.* II. 3 hr. PR: Forestry senior or consent. Analysis and case studies of problems pertinent to the integration of wood conversion technology with principles of production, marketing, and management.

Forest Management

F.M.

12. *Forest Ecology.* II. 3 hr. PR: Biol. 51. Forest and environment factors; site and type characteristics.

100. *Forest Surveying and Mensuration Field Practices.* S. 3 hr. PR: Forestry major or consent; Biol. 51, C.E. 5, F.M. 122. The application of surveying and mensurational practice with emphasis on field problems. ($30.00 lab fee.)

101. *Forest Management, Utilization, and Wildlife Practices.* S. 3 hr. PR: Forestry major or consent; F.M. 100. Study of forest management utilization and wildlife problems. Trip to observe forest management and utilization in the Southern Pine Region. ($30.00 lab fee.)

122. *Forest Mensuration.* II. 3 hr. PR: Forestry major or consent; Math. 3, 4. Introduction to statistics and basic sampling concepts. Measurement of forest products, trees, stands growth, and yield.

132. *Farm Woods Management.* II. 3 hr. Students majoring in forest resource management and wood industry may not take this course for credit. Characteristics of forest trees; management of farm woods for timber, wildlife, watershed protection, and recreation; measuring and marketing farm timber; plantation establishment.

151. *Fire Control and Watershed Protection.* I. 3 hr. PR: Upperclass standing only. Protecting the forest and forested watersheds from improper land use and wildfire. Importance of forest insects and disease. Emphasis on atmospheric influences, improper land use, wildfire prevention and control and fire as a tool in forest land management.

211. *Silvicultural Systems.* I. 4 hr. PR: Forestry major or consent; F.M. 12. Principles of regeneration cuttings, intermediate cuttings, and cultural operations, with their application to forest stands.

213. *Regional Silviculture.* I. 2 hr. PR: Forestry major or consent; F.M. 12; PR or Conc.: F.M. 211. Major forest types of the United States: their composition, management, problems, and silvicultural treatment.

215. *Principles of Artificial Forestation.* II. 3 hr. PR: Forestry major or consent; F.M. 12. Seeding and planting nursery practice; phases of artificial regeneration.

216. *Forest Genetics and Tree Improvement.* II. 3 hr. PR: Forestry major or consent; Genet. 272 or equiv., or consent. Forest genetic principles and their application to forest tree improvement, including crossing methods, selection systems, and other techniques.

222. *Forest Mensuration.* II. 3 hr. PR: Forestry major or consent; F.M. 122. Measurement of growth and yield; statistical methods applied to forest measurement problems.

230. *Principles of Forestry Economics.* II. 3 hr. PR: Forestry major or consent; Econ. 51 and 52 or equiv. Production, distribution, and use of forest goods and services. Emphasis on analytical methods and techniques dealing with forest economic problems.

232. *Forest Finance.* II. 2 hr. PR: Forestry junior or consent. Interest, discount, and rate earned, in forest production and exploitation. Particular reference to determining value of standing timber, appraisal of forest damages, and forest taxation.

233. *Forest Management.* I. 4 hr. PR: Summer Camp; PR or Conc.: Forestry major or consent; F.M. 211. Principles of substained yield forest management. Organization of forest area, selection of management objectives, application of silvicultural systems, and regulation of cut. Forest management plan.

234. *Integrated Forest Resources Management.* II. 3 hr. PR: Forestry major or consent; senior standing. Analysis and planning for management of forest resources. Primarily involves carrying out a major management problem assignment, with actual forest tracts as focal point.

330. *Advanced Principles of Forestry Economics.* II. 3 hr. PR: Econ. 51, 52 or equiv.; F.M. 230 or equiv. Intensive study of both micro- and macroeconomics of forestry.

Wood Science

W.S.

100. *Wood Industries Field Trip.* S. 2 hr. PR: Forestry major or consent; W.S. 134. A two-week trip to observe manufacturing methods and techniques of commercial wood industry plants including furniture, plywood, veneer, hardboard, particle board, pulp and paper, sawmilling, and preservation. ($30.00 lab fee.)

121. *Wood Technology.* I. 3 hr. PR: Forestry major or consent; Biol. 51. For students other than those taking the wood industries and wood science options, designed to provide familiarity with the technical aspects of wood utilization.

123. *Wood Identification.* I. 3 hr. PR: Forestry major or consent; Biol. 51. Identification of commercial timbers of the U.S.; basic properties and uses of different woods.

130. *Wood Processes and Products.* II. 3 hr. PR: Forestry major or consent; F.M. 122. Conversion of standing timber into primary and secondary products.

132. *Primary Conversion and Grading.* II. 3 hr. PR: Forestry major or consent; W.S. 123. Principles of the conversion of raw material in log form to primary wood products. Elements of the grading of raw materials and primary products. Production planning and control. Primarily for wood industry and wood science.

134. *Secondary Manufacturing Processes.* II. 3 hr. PR: W.S. 123 or consent. Detailed study of the materials and processes involved in manufacture of secondary wood products.

141. *Properties of Wood.* I. 3 hr. PR: Forestry major or consent; W.S. 123. Physical and mechanical properties of wood.

231. *Wood Finishing.* I. 3 hr. PR: Forestry major or consent; W.S. 121. Surface preparation, composition of finishing materials, equipment, techniques, defects, troubleshooting, and quality control.

232. *Theory and Practice of Wood Adhesion.* I. 3 hr. PR: Forestry major or consent; W.S. 123, 141. Detailed theoretical introduction and examination of different types of adhesives and gluing techniques used in wood industry.

234. *Statistical Quality Control.* II. 3 hr. PR: Forestry major or consent; W.S. 134. Methods used to control quality of manufactured wood products. Control charts of variables and attributes. Acceptance sampling techniques.

235. *Light-Frame Wood Construction.* I. 2 hr. PR: Forestry major or consent. Use of wood in light-frame construction. Basic design procedures and contruction methods.

240. *Wood Moisture Relationships.* II. 3 hr. PR: Forestry major or consent; W.S. 123. Principles involved in the relation between wood and moisture, and purposes, effects, and methods of seasoning.

251. *Forest Products Protection.* I. 3 hr. PR: Forestry major or consent; W.S. 123, 134. Biological organisms responsible for deterioration of wood products, their control by preservative methods, and study of fire retarding methods.

320. *Wood Microstructure.* I. 3 hr. PR: W.S. 123; senior standing, or consent. Detailed examination of wood microstructure as it relates to processing, behavior, and identification.

Wildlife Management

W.M.

100. *Wildlife Summer Field Trip.* S. 1 hr. PR: Forestry major or consent; W.M. 131. Two-week field trip to acquaint wildlife students with major wildlife habitats outside of the central Appalachians and with selected major wildlife refuges, shooting preserves, and other intensively managed areas. (Approved summer work experience in the wildlife field may be substituted for this course.)

122. *Ornithology.* II. 2 hr. PR: Biol. 1, 2, or consent. Identification, distribution, and ecology of birds (particularly of forest lands).

131. *Wildlife Management.* I. 3 hr. PR: Forestry major or consent; Biol. 2. Basic principles of handling wildlife as a forest crop, including population of dynamics, ecological relationships, social behavior, habitat manipulation, and game administration.

213. *Wildlife Ecology.* I. 4 hr. PR: Forestry major or consent; Biol. 1 and 2. Basic principles of ecology and their application to wildlife. Field and laboratory studies of major ecosystems important to wildlife, including management of these ecosystems for wildlife.

222. *Field Ornithology.* S. 3 hr. PR: Biol. 2 or consent. Intensive field studies in recognition through sight, song, and behavioral patterns of birds, and their ecology in the central Appalachians. (Course taught at Terra Alta Biological Station.)

224. *Forest Zoology.* II. 3 hr. PR: Biol. 2. Relationships of mammals, birds, reptiles, amphibians, and fish to the forest, with emphasis on ecology and taxonomy of these groups. Laboratory emphasizes wildlife anatomy.

231. *Wildlife Techniques.* I. 3 hr. PR: Forestry major or consent; W.M. 213, Biol. 151. Field and laboratory techniques necessary in management and study of wildlife; collection of field data, mapping, censusing, habitat evaluation, literature and scientific writing.

234. *Principles of Wildlife Management.* II. 3 hr. PR: Forestry major or consent; W.M. 213. Major game animals and problems and principles involved in their management.

312. *Wildlife Population Ecology.* II. 3 hr. PR: W.M. 131, Stat. 211, or equiv. Theory of population growth, population change, intraspecific and interspecific relationships involved in natural regulation of populations, and effects of exploitation on wildlife populations.

370. *Wildlife Seminar.* II. 1 hr. per sem.; (4 hr. max.). PR: Consent. Discussion of current developments in wildlife management.

Recreation and Parks

R & P

13. *Recreation and the School.* I. 3 hr. PR: Forestry major or consent. Open to students with at least sophomore status in physical education. Study of basic concepts of play, recreation, leisure, and their relationship to physical education.

40. *Nature Recreation and Camping.* II. 3 hr. PR: Forestry major or consent; recreation majors. Lecture and workshop. Introduction to organized camping movement including purposes, camp sites, equipment, programs, and leadership. Exploration of nature recreation and its relationship to community recreation and camping programs.

41. *Social Recreation.* I. 3 hr. PR: Forestry major or consent. Lecture and workshop course. Place of social recreation activities, informal dramatic and music in community center, playground, camp and school extracurricular programs.

43. *Man and Leisure.* I. 3 hr. Function of leisure and play in the life of the individual and in society, in historical and current perspective.

44. *Introduction to Recreation and Park Services.* II. 4 hr. PR: Sophomore standing, second semester, R & P 43. Development of recreation, park, and conservation movements in the U.S. and the responsible agencies; examination of principles, scope, and trends in program services, spatial accommodations; study of leadership in providing recreation services.

100. *Approved Summer Park Experience and Report.* S. 1 hr. PR: Forestry junior or consent. One summer's experience in management of a park or related recreational enterprise followed by a written report.

142. *Fundamentals of Nature Interpretation.* II. 3 hr. PR: Forestry senior or consent. Methods and techniques of interpreting the natural environment to individuals and groups.

202. *Recreation Internship.* I. 3 hr. PR: R & P 43, 44, 265; Forestry major or consent. A supervised, full-time recreation leadership responsibility for a minimum of 8 weeks. Position approval in advance. Comprehensive written analysis prepared following internship field experience.

233. *Wildland Recreation Administration.* I. 3 hr. PR: Forestry junior standing or consent. Introduction to administration and management problems associated with providing recreation in wildland areas.

235. *Administration of Urban and Regional Recreation Services.* I. 3 hr. PR: Forestry major, R & P 43, 44, and 265 or consent. Administration of recreation and parks agencies, including legal foundations and responsibilities, organizational structures, personnel, finance, and services.

251. *Recreation Leadership.* I. 3 hr. PR: Forestry major or consent. Leadership, its application to recreation, and analysis of techniques. Examination of social group work method and its application, particularly in national youth organizations.

263. *Program Planning.* II. 3 hr. PR: Forestry major or consent; R & P 1. Fundamentals for general program planning; considers needs, facilities, age groups, local customs, climatic factors, etc. Planning involved in playgrounds, indoor centers, playfields, parks, hospitals, voluntary agencies, industry, and campus.

265. *Functional Planning of Recreation and Park Facilities.* II. 3 hr. PR: Forestry major or consent. Lecture and workshop. Problems and principles governing planning for functional and effective use of recreation facilities. Emphasis on playgrounds, playfields, indoor centers, parks, camps, and swimming pools.

271. *Administration of Camping Services.* II. 3 hr. PR: Forestry major or consent; R & P 40 or equiv. Principles involved in modern camping programs, and organization and administration of camps.

272. *Professional Synthesis.* II. 3 hr. PR: Forestry major or consent; senior standing, last semester of professional education, 16 hr. professional courses in recreation and parks management. A "capstone" course which requires the student to synthesize professional training into analysis and solution of a special problem in the student's option of Recreation and Parks Management.

316. *Philosophy of Recreation.* II. 3 hr. PR: Consent. Interpretation of recreation as a basic part of the living process; importance to individual community and national welfare; social and economic significance.

324. *Outdoor Recreation in Our Modern Society.* II. 3 hr. PR: For persons in recreation, park, outdoor education and conservation, or consent. Interpretation as to what outdoor recreation is, what people do, where they go, how this affects our economic, social, and cultural life, and significant trends.

348. *Outdoor Education and School Camping.* II. 3 hr. PR: For majors in education, recreation, extension, forestry, or consent. Interpretation and programming outdoor recreation.

Division of Plant Sciences

Faculty

Mannon E. Gallegly, Jr., Ph.D. (U. Wisc.), *Chairperson, Division of Plant Sciences; Professor of Plant Pathology and Plant Pathologist.*

R. E. Adams, Ph.D. (Cornell U.), *Professor of Plant Pathology and Plant Pathologist*

John J. Albert, Ph.D. (VPI), *Assistant Professor of Plant Pathology and State Extension Specialist — Plant Pathology, University Experiment Farm, Kearneysville.*

James F. Ali, M.S. (WVU), *Research Assistant in Agronomy*

Freddie L. Alt, M.S. (WVU), *Instructor in Agronomy and Farm Superintendent.*

Barton S. Baker, Ph.D. (WVU), *Assistant Professor of Agronomy and Assistant Agronomist, Allegheny Highlands Project, Elkins.*

John A. Balasko, Ph.D. (U. Wisc.), *Assistant Professor of Agronomy and Assistant Agronomist.*

John F. Baniecki, Ph.D. (U. Ariz.), *Assistant Professor of Plant Pathology and State Extension Specialist — Plant Pathology and Entomology.*

H. L. Barnett, Ph.D. (Mich. St. U.), *Professor of Mycology and Mycologist.*

Joseph G. Barrat, Ph.D. (U. N. Hamp.), *Professor of Plant Pathology and Superintendent, University Experiment Farm, Kearneysville.*

Newton M. Baughman, Ph.D. (Purdue U.), *Professor of Agronomy and Agronomist; Director, International Programs.*

Bradford C. Bearce, Ph.D. (U. Calif.), *Associate Professor of Horticulture and Associate Horticulturist.*

Larry G. Bennett, Ph.D. (WVU), *Research Assistant, Agronomy.*

Orus L. Bennett, Ph.D. (WVU), *Assistant Professor of Agronomy and Research Soil Scientist, U.S.D.A.*

Steven Blizzard, M.S. (WVU), *Instructor in Horticulture and Farm Superintendent.*

James L. Brooks, Ph.D. (U. Calif.), *Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

Linda Butler, Ph.D. (U. Ga.), *Associate Professor of Entomology and Associate Entomologist.*

William H. Childs, Ph.D. (Cornell U.), *Professor Emeritus of Horticulture.*

Edward S. Elliott, Ph.D. (WVU), *Professor of Plant Pathology and Plant Pathologist.*

Edwin Gould, B.S. (WVU), *Associate Professor Emeritus of Entomology, University Experiment Farm, Kearneysville.*

Walter E. Grube, M.S. (Penn. St. U.), *Research Assistant, Agronomy.*

N. Carl Hardin, Jr., M.S. (WVU), *Professor of Horticulture and State Extension Specialist — Horticulture.*

Clinton E. Hickman, M.S. (WVU), *Assistant Professor of Horticulture and Assistant Horticulturist and Superintendent, Ohio Valley Farm, Point Pleasant.*

L. Morris Ingle, Ph.D. (Purdue U.), *Professor of Horticulture and Horticulturist.*

Everett M. Jencks, Ph.D. (Rutgers U.), *Associate Professor of Agronomy and Associate Agronomist.*
Walter J. Kaczmarczyk, Ph.D. (Hahnemann Med. C.), *Associate Professor of Genetics and Associate Geneticist.*
Robert F. Keefer, Ph.D. (Ohio St. U.), *Associate Professor of Agronomy and Associate Agronomist.*
Virgil G. Lilly, Ph.D. (WVU), *Professor Emeritus of Physiology.*
William L. MacDonald, Ph.D. (Iowa St. U.), *Assistant of Plant Pathology and Assistant Plant Pathologist.*
Ray S. Marsh, A.M. (U. Mo.), *Professor Emeritus of Horticulture.*
Paul G. Moe, Ph.D. (Rutgers U.), *Professor of Bacteriology and Bacteriologist.*
Joginder Nath, Ph.D. (U. Wisc.), *Professor of Genetics and Geneticist.*
Oliver M. Neal, Jr., Ph.D. (Mich. St. U.), *Professor of Horticulture and Horticulturist.*
G. Gordon Pohlman, Ph.D. (Iowa St. C.), *Professor Emeritus of Agronomy.*
David O. Quinn, M.S. (WVU), *Associate Professor of Plant Pathology and State Program Leader — Safe Use of Pesticides.*
Oscar E. Schubert, Ph.D. (U. Ill.), *Professor of Horticulture and Horticulturist.*
Eion G. Scott, Ph.D. (U. Calif.), *Professor of Horticulture and Horticulturist.*
George Sharpe, M.S. (WVU), *Associate Professor Emeritus of Agronomy.*
Rabindar N. Singh, Ph.D. (VPI), *Assistant Professor of Agronomy and Assistant Agronomist.*
Richard M. Smith, Ph.D. (Ohio St. U.), *Professor of Agronomy and Agronomist.*
Charles B. Sperow, Jr., M.S. (WVU), *Associate Professor of Agronomy and State Extension Specialist — Crops Agronomy.*
David A. Stelzig, Ph.D. (N.D. St. U.), *Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*
LeRoy P. Stevens, M.S. (WVU), *Assistant Professor of Horticulture, Assistant Horticulturist and Superintendent, Reedsville Experiment Farm.*
R. Philip True, Ph.D. (U. Penn.), *Professor Emeritus of Plant Pathology.*
Valentin Ulrich, Ph.D. (Rutgers U.), *Professor of Genetics and Geneticist.*
Vincent J. Valli, M.S. (Ohio Christ. C.), *Assistant Professor of Agricultural Meteorology and Assistant Agricultural Meteorologist.*
Willem A. van Eck, Ph.D. (Mich. St. U.), *Professor of Soil Science and State Extension Specialist — Soil Science.*
Collins Veatch, Ph.D. (U. Ill.), *Professor Emeritus of Agronomy.*
Joseph E. Weaver, M.S. (WVU), *Research Assistant, Entomology.*
Harold A. Wilson, Ph.D. (Iowa St. C.), *Professor Emeritus of Bacteriology.*
Robert J. Young, Ph.D. (Ore. St. U.), *Assistant Professor of Plant Pathology and Assistant Plant Pathologist.*
Roger S. Young, Ph.D. (Mich. St. U.), *Assistant Professor of Horticulture and Assistant Horticulturist, University Experiment Farm, Kearneysville.*
Richard L. Zimmerman, Ph.D. (WVU), *Assistant Professor of Plant Sciences and State Extension Specialist, Plant Sciences and Conservation.*

Bachelor of Science in Agriculture

PLANT AND SOIL SCIENCES CURRICULUM

Students enrolled in this degree program may select courses to develop interest areas in *agronomy, horticulture, soil science,* or *environmental protection,* to prepare for positions involving various phases of commercial crop production and use, soil conservation, pedology and soil survey, land reclamation and revegetation, land management and classification, fertilizer use, weed con-

trol, insect and disease control, plant breeding, farm management, and turf and golf course maintenance. Graduates may be self employed or develop careers with commercial industries involved with the development and distribution of pest-control chemicals, fertilizers, seeds and plants, and nursery, floral, garden, and turf products. Also, positions as estate and farm managers, land reclamationists, city and county planning technicians, park and golf course superintendents and environmental protectionists are available to graduates of this program, as well as many different positions with state and federal governmental agencies.

By judicious selection of courses the student may also acquire the necessary background in the basic sciences to enter professional or graduate programs of study in such fields as agricultural biochemistry, bacteriology, crop science, entomology, genetics, horticulture, mycology, plant pathology, and soil science.

For all students in the curriculum in Agriculture the program of courses taken in the freshman year is essentially the same. However, students are urged to select the appropriate adviser so that they may develop their program of study in one of the areas described above while meeting the requirements for the curriculum which are as follows:

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	24
(Must elect a minimum of 8 credits in biology; 8 credits in chemistry; 3 credits in college algebra or equivalent)	
Courses in Agriculture	45
Elect a minimum of 3 credits in each of the following:	
1. Animal Science 3. Soil Science	
2. Plant Science 4. Agricultural Economics	
Elect additional courses to obtain a total of 45 credits in Agriculture.	
Physical Education	2
Free Electives*	35
Total	136

*Student may elect to take courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Courses of Instruction

Assigned Topics

In order to be eligible to register in Assigned Topics 180, the student must: (1) be in good standing, and (2) obtain approval of the appropriate Division Director prior to registration.

Plant Science

Plant Sci.

52. *Principles of Plant Science.* II. 4 hr. Basics of the nature, history, classification, role, distinction, structure and function, reproduction, improvement, culture, pests, storage and handling, production and marketing, and utilization of agricultural plants.

180. *Assigned Topics.* I, II, S. 1-4 hr. Special studies in Agronomy (crops & soils), Bacteriology, Entomology, Genetics, Horticulture or Plant Pathology. Students eligible for this course must be in good standing and have Division approval of a proposed outline.

195. *Seminar.* I, II. 1 hr. A seminar aimed at exploring, through a discussion format, current problems in agricultural environmental protection.

200. *Recognition and Diagnosis of Plant Disorders.* I. 4 hr. PR: Plant Path. 201 and Entom. 204. Creates an ability for the student to use systematic inspection to determine cause or causes of a plant disorder.

201. *Principles and Methods of Plant Pest Control.* II. 4 hr. PR: Plant Path. 201 and Entom. 204. Concepts of control and how they are implemented by exclusion, eradication, protection, and immunization.

Agronomy

Agron.

2. *Principles of Soil Science.* II. 4 hr. PR: Inorganic chemistry. An introduction to soil science. 3 lec., 1 lab.

10. *Forest Soils.* I. 3 hr. PR: Inorganic Chem. Principles of soil science with particular reference to forest soils. 2 lec., 1 lab.

115. *Soil Judging, Mapping and Interpretation.* I. 3 hr. PR: Agron. 2 or 10. Techniques in observing and describing soil profiles, mapping by modern systems and interpreting basic soil surveys for varied soil use.

210. *Soil Fertility.* I. 3 hr. PR: Agron. 2 or 10. Soil properties in relation to fertility and productivity of soils; evaluation of soil fertility; production of fertilizers and their use in increasing soil fertility and productivity.

212. *Soil Conservation and Management.* II. 3 hr. PR: Agron. 2 or 10. Using soil technology to solve soil management problems relating to cropping systems. Field diagnosis of soil problems stressed. (Offered in Spring of odd years.)

230. *Soil Physics.* II. 3 hr. PR: Agon. 2 or 10. Physical properties of soils; water and air relationships and their influence on soil productivity. (Offered in Spring of even years.)

250. *Turfgrass Management.* I. 3 hr. PR: Agron. 2 or consent. Establishment, maintenance, and adaption of grasses and legumes for lawns, golf courses, parks, athletic fields, and roadsides. Turf-grass management by associating differential plant responses with soil climatic, and biotic factors that influence plant species growth, selection, and adaptation. (Offered in Fall of even years.)

251. *Weed Control.* I. 3 hr. PR: Plant Sci. 52, Agron. 2, or consent. Fundamental principles of weed control. Recommended control measures for and identification of common weeds. (Offered in Fall of odd years.)

252. *Grain and Special Crops.* I. 3 hr. PR: Plant Sci. 52, Agron. 2, or consent. Advanced study of methods in the production of grain and special crops. Varieties, improvement, tillage, harvesting, storage, and use of crops grown for seed or special purposes. (Offered in even years.)

254. *Pasture and Forage Crops.* II. 4 hr. PR: Plant Sci. 52, Agron. 2, or consent. All phases of pasture and forage crop production, including identification, seeding, management, use, seed production, and storage of forage crops. 3 lec., 1 lab.

301. *Geotechnic.* I. 3 hr. PR: Consent. A unified approach to various aspects of soil formation and influence of formative factors on the nature of soils and their use as engineering materials. Course serves as a common meeting ground for students

in the various disciplines concerned with earth science. 3 lec. (Offered in Fall of odd years.)

315. *Soil Genesis and Classification.* I. 3 hr. PR: Agron. 2 or 10. Origin and formation of soils. Study of soil profiles and soil forming processes in field and laboratory. Principles of classification and techniques of soil mapping. 2 lec., 1 lab. (Offered in Fall of even years.)

Bacteriology

Bact.

141. *General Bacteriology.* I, II. 4 hr. PR: Inorganic Chem. Introductory morphological, cultural, and physiological characteristics of bacteria; application of bacteriology to agriculture, home economics, sanitation, and health.

314. *Soil Microbiology.* II. 4 hr. PR: Bact. 141 and organic chemistry. Occurrence and distribution of microorganisms in soils and their interrelationships. Their role in decomposition of organic matter and other transformations of soil constituents. (Offered in Spring of odd years.)

347. *Food Microbiology.* I. 4 hr. PR: Bact. 141, organic chemistry or consent. Ecology and physiology of microorganisms important in the manufacture and deterioration of foods. Techniques for the microbiological examination of food. (Offered in Fall of even years.)

348. *Sanitary Bacteriology.* I. 3 hr. PR: Bact. 141. Standard bacteriological methods used in routine examination of water and sewage. (Offered in Fall of odd years.)

Entomology

Entom.

152. *Forest Entomology.* II. 3 hr. PR: F.M. 211. Relationships between insects and the forest; recognition and control of important species. This course is primarily designed for forestry students.

204. *Principles of Entomology.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Basic course dealing with the anatomy, morphology, physiology, reproduction, systematics, ecology, and control of insects.

Genetics

Genet.

171. *Principles of Genetics.* II. 4 hr. PR: 8 hr. of biological science. The fundamentals of inheritance.

290. *Crop Breeding.* II. 3 hr. PR: Genet. 171 or 321. Methods and basic scientific principles involved in improvement of leading cereal and forage crops through hybridization and selection. (Offered in Spring of odd years.)

321. *Basic Concepts of Modern Genetics.* I. 3 hr. PR: 8 hr. biological science and 1 year chemistry. Independent inheritance, linkage. Chemical nature of genetic material. Control of phenotype by genetic material. Gene action and coding of genetic material.

325. *Human Genetics.* I. 3 hr. PR: Genet. 171 and 321 or consent. Study of genetic system responsible for the development of phenotype in man. (Offered in Fall of even years.)

335. *Population Genetics.* I. 3 hr. PR: Genet. 171 or 321, or consent. Relationship of gene and genotype frequencies in populations of diploid organisms, and effects of mutation, migration, selection, assortive mating, and inbreeding in relation to single gene

pairs. Application of these concepts to multigenic inheritance of quantitative traits. (Offered in Fall of even years.)

Horticulture

Hort.

107. *General Horticulture.* I. 3 hr. PR: Biol. 1, Plant Sci. 52 or consent. Principles underlying present day horticulture practice with special emphasis on how basic discoveries in plant science has been applied in horticulture.

115. *Judging and Identification of Apple Varieties.* I. 1 hr. Two laboratory periods half of semester. Identification and judging of apple varieties.

116. *Flower Judging.* II. 1 hr. One laboratory period per week. Identification and judging of flowers with emphasis on the aesthetic values which underlie desirability in a variety.

117. *Vegetable Identification and Judging.* I. 1 hr. Identification and judging the common vegetables and the test associated with olericulture in West Virginia. Emphasis is placed on the cultural practices associated with top quality vegetables.

151. *Floral Design.* I. 3 hr. A basic course in flower arrangement to cover occasions for the home and retail flower shop.

160. *Woody Plant Materials.* I. 3 hr. Identification, ecology, and evaluation of trees, shrubs, vines and groundcovers for landscape plantings.

162. *Plant Materials.* I. 3 hr. Identification, description, adaptability and evaluation of the principal kinds and varieties of annual and herbaceous perennials with emphasis on their use as design elements.

204. *Plant Propagation.* II. 3 hr. Study of practices of plant propagation and factors involved in reproduction in plants. (Offered in Spring of odd years.)

229. *Landscape Design.* I. 3 hr. (1 lec., 1 scheduled lab., 1 arranged lab.). An appreciation of basic principles of design and information pertaining to use and care of ornamental plants around the house.

242. *Small-Fruits.* I. 3 hr. (2 lec., 1 scheduled lab.). PR: Plant Sci. 52, Hort. 107, or consent. Taxonomic, physiological, and ecological principles involved in production and handling of small-fruits. (Offered in Fall of even years.)

243. *Physiology of Vegetables.* I. 3 hr. (2 lec., 1 scheduled lab.). PR: Plant Sci. 52. Physiological and ecological principles involved in production of vegetable crops. (Offered in Fall of odd years.)

244. *Handling and Storage of Horticultural Crops.* II. 3 hr. (2 lec., 1 scheduled lab.). PR: Plant Sci. 52, Chem. 16. Characteristics of perishable crops. Methods and materials used to maintain quality. (Offered in Spring of even years.)

245. *Greenhouse Management.* II. 3 hr. Greenhouse as a controlled plant environment. How to manipulate factors influencing plant growth and development within specialized environments of greenhouses.

301. *Post-Harvest Physiology.* II. 3 hr. (1 lec., 2 labs.). Physiology and biochemistry of harvested crops. (Offered in Spring of odd years.)

Plant Pathology

Plant Path.

153. *Forest Pathology.* I. 3 hr. PR: Biol. 2, F.M. 211. Important diseases of forest and shade trees. Causes and methods of control.

201. *General Plant Pathology.* I. 4 hr. Nature and causes of plant diseases; methods of control.

301. *Diseases of Economic Plants.* I, II, S. 1-3 hr. per sem. 2 hr. in Summer. PR: Plant Path. 201 or 303 or consent. Recognition, cause, and control of diseases of economic plants; Sem. I, Diseases of vegetable crops and of trees and small fruits; Sem. II, Diseases of ornamental plants and field and forage crops; S, Diseases of forest trees. Students may register for 1-3 hr. in Sem. I and II, 2 hr. in Summer, until 8 hours of credit are accumulated. (Offered in 1975-76 and in alternate years.)

302. *Principles of Plant Pathology.* II. 4 hr. PR: Plant Path. 153, 201, or 303, or consent. Primarily for graduate students and seniors majoring in biology, botany, or agricultural science. Nature of disease in plants with practice in laboratory methods. (Offered in Spring of even years.)

303. *Mycology.* I. 4 hr. Lectures and field and laboratory studies of parastic and saprophytic fungi.

309. *Nematology.* II. 3 hr. Primarily for graduate students majoring in the agricultural sciences or biology. Nematode taxonomy, bionomics, and control, with particular emphasis on plant parastic forms. (Offered in Spring of odd years.)

Division of Resource Management

Faculty

Kenneth D. McIntosh, Ph.D. (U. Wisc.), *Chairperson, Division of Resource Management, Professor of Agricultural Economics and Agricultural Economist.*

Victor F. Amann, Ph.D. (U. Minn.), *Adjunct Associate Professor of Agricultural Economics and Chief of Party. (Makerere University, Kampala, Uganda.)*

Paul V. Armbrester, M.S. (WVU), *Assistant Professor of Agricultural Education and Assistant to the Dean.*

Alfred L. Barr, Ph.D. (Okla. St. U.), *Chairperson, Division of Animal and Veterinary Sciences and Professor of Agricultural Economics and Agricultural Economist.*

Russell C. Butler, Ph.D. (Cornell U.), *Professor Emeritus of Agricultural Education and Education.*

James H. Clarke, Ph.D. (U. Minn.), *Professor of Agricultural Economics and Agricultural Economist.*

Clifford W. Collier, Jr., M.L.A. (U. Ga.), *Associate Professor and Extension Landscape Architect.*

Edmond B. Collins, M.S. Ag.E. (WVU), *Associate Professor of Agricultural Engineering.*

Dale K. Colyer, Ph.D. (U. Wisc.), *Professor of Agricultural Economics and Agricultural Economist.*

Robert G. Diener, Ph.D. (Mich. St. U.), *Associate Professor of Agricultural Engineering and Associate Agricultural Engineer.*

Gerald V. Eagan, Ph.D. (U. Tenn.), *Assistant Professor of Agricultural Economics and State Extension Specialist — Agricultural Economics.*

Kendall C. Elliott, M.S. Ag.E. (WVU), *Assistant Professor of Agricultural Engineering and Assistant Agricultural Engineer.*

Roy E. Emerson, M.S. (Cornell U.), *Associate Professor of Agricultural Engineering and Associate Agricultural Engineer.*

Homer C. Evans, Ph.D. (U. Minn.), *Professor of Agricultural Economics and Agricultural Economist, Associate Director of Agricultural Experiment Station, and Associate Dean, College of Agriculture and Forestry.*

Ernest C. Goff, *Research Assistant in Agricultural Economics.*
Kenneth J. Hock, Ph.D. (U. Ariz.), *Assistant Professor of Agricultural Economics and Assistant Agricultural Economist.*
Oscar C. Hutchison, Jr., M.S. (WVU), *Assistant Professor of Agricultural Education and Area Director, Beckley Area, Appalachian Center.*
Robert L. Jack, Ph.D. (Penn. St. U.), *Professor of Agricultural Economics and Agricultural Economist.*
Warren G. Kelly, Ed.D. (U. Mo.), *Associate Professor of Agricultural Education and Education.*
Michael J. Kridle, *Draftsman.*
John P. Kuehn, Ph.D., (U. Tenn.), *Assistant Professor of Agricultural Economics and Assistant Agricultural Economist.*
Alon Kvashny, M.L.A. (U. Mich.), *Assistant Professor of Landscape Architecture and Assistant Landscape Architect.*
Layle D. Lawrence, Ph.D. (LSU), *Assistant Professor of Agricultural Education and Education.*
Mike Wun-Min Lin, M.S. (U. Wis.), *Assistant Professor of Landscape Architecture.*
George W. Longenecker, M.F.A. (U. Ill.), *Assistant Professor of Landscape Architecture.*
A. D. Longhouse, P.E., Ph.D. (Cornell U.), *Professor of Agricultural Engineering and Agricultural Engineer.*
O. Claude McGhee, Ph.D. (Ohio St. U.), *Associate Professor of Agricultural Education and Education.*
Robert H. Maxwell, Ph.D. (Cornell U.), *Associate Professor of Agricultural Education, and Unit Manager, Allegheny Highlands Project.*
Joseph L. Morris, M.S. Agr. (WVU), *Assistant Professor of Agricultural Education and Area Director, Morgantown Area, Appalachian Center.*
Ralph E. Nelson, Ph.D. (U. Minn.), *Professor of Agricultural Economics and Provost, Off-Campus Education.*
Ernest J. Nesius, Ph.D. (Iowa St. U.), *Benedum Professor of Agricultural Economics.*
Paul E. Nesselroad, Ph.D. (Penn. St. U.), *Associate Professor of Agricultural Economics and Associate Agricultural Economist.*
Robert S. Pell, *Certified Engineering Technician.*
James B. Root, B.L.A. (U. Ga.), *Visiting Assistant Professor of Landscape Architecture.*
Arthur W. Selders, M.S. Ag.E. (U. Mass.), *Associate Professor of Agricultural Engineering and State Extension Specialist — Agricultural Engineering.*
Ronald L. Stump, M.S. (WVU), *Dean, Appalachian Center, and Director, Cooperative Extension Service and Assistant Professor of Agricultural Economics*
Mary E. Templeton, M.S. (WVU), *Associate Professor of Agricultural Economics and Associate Agricultural Economist.*
George E. Toben, M.S. (U. Ill.), *Professor of Agricultural Economics and Agricultural Economist.*
F. Wayne Weber, M.S. (WVU), *Agricultural Research Economist, Economic Research Service, United States Department of Agriculture.*
Virgil L. Whetzel, M.S. (WVU), *Agricultural Research Economist, Economic Research Service; United States Department of Agriculture.*

Programs

Division of Resource Management

Three curriculums are available within the Division from which students may choose at the baccalaureate level: Resource Management, Agricultural Education, and Landscape Architecture.

Students whose choice is Resource Management are able to emphasize agribusiness and agricultural mechanics in their program of study.

Bachelor of Science

RESOURCE MANAGEMENT CURRICULUM

The curriculum of bachelor of science, with its flexible design, will provide the student with the opportunity to acquire the necessary background in mathematics, statistics, computer science, and economic theory and modern concepts of science in preparation for professional or graduate study. Selection of individual courses is the responsibility of the student in consultation with his adviser.

Curriculum Requirements	*Hours*
English composition and rhetoric (or conformity with University English requirements)	6
Physical Education	2
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	20
The student shall elect a minimum of one course in each: history, political science, psychology, and sociology and anthropology	
Natural Sciences (Group C)	26
The student shall elect two courses in calculus and two in statistics.	
Computer Science	6
Courses in the College of Agriculture and Forestry	24
Electives*	32
Total	128

*Student may elect to take courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Bachelor of Science in Agriculture

RESOURCE MANAGEMENT CURRICULUM

A major in Resource Management, developed with a qualified adviser, will provide a student with the opportunity to acquire the necessary background courses for over 40 established and basic careers. Considerable latitude is provided to the student for supportive courses in Agriculture and other University offerings in planning the curriculum.

Special interest areas falling in this Major include; economic development of communities or rural areas, extension education, farm and agribusiness management, agricultural economics, agricultural mechanics technology, land economics, production economics, marketing, credit and general agriculture.

Curriculum Requirements	*Hours*
English composition and rhetoric (or conformity with University English requirements)	6
Physical Education	2
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C)	12
Foundation requirements in Agriculture (A minimum of three hours in each of the following: animal science, plant science, soil science, agricultural economics, and agricultural mechanics)	15
Additional courses in Agriculture (This is a minimum credit in agriculture above agricultural courses identified in the foundation requirements in agriculture. These courses may be elected to prepare for special interest areas)	30
Electives* (Students preparing for selected professional careers or certification need to elect the courses required)	47
Total	136

*Student may elect to take courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Bachelor of Science in Agriculture

AGRICULTURAL EDUCATION CURRICULUM

The main purpose of agricultural education is to educate those who would be teachers of vocational agriculture.

A good vocational agriculture teacher can assist in the economic and social development of a community. One can accomplish this by teaching a total program of vocational agriculture, in and through the high school. Day, young farmer, adult farmer, and off-farm agricultural occupations classes and groups, taught through supervised occupational experience programs, are the tools with which the vocational teacher helps build a more desirable community.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included) (Must elect a minimum of 8 credits in biology; 8 credits in chemistry; 3 credits in college algebra or equivalent)	24
Courses in Agriculture	45
Elect a minimum of 3 credits in each of the following: 1. Animal Science 2. Plant Science 3. Soil Science 4. Agricultural Economics	
Elect additional courses to obtain the total of 45 credits in Agr.	
Physical Education	2
Free Electives*	35
Total	136

*Student may elect to take courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Students pursuing this program will meet requirements for certification by the West Virginia Department of Education. The program provides students with the opportunity to become qualified to teach in the broad field of vocational agriculture as well as to become especially prepared to teach in agricultural production and management, animal processing, agricultural mechanics, agricultural sales and services, conservation, horticulture produce industry, or ornamental horticulture. Students in agricultural education have an opportunity to study extension education also in preparation for careers in extension activities.

A student selecting the comprehensive field for vocational agriculture teaching shall complete the above listed curriculum requirements. It also is suggested that each student choose one of the seven options to guide his program of study.

Students enrolled in this curriculum are advised to refer to the section of this *Catalog*, entitled: "Programs for Professional Certificates Junior and Senior High School" in the Division of Education.

A. Agricultural Production and Management 17
B. Animal Processing 17
C. Agricultural Mechanics 17
D. Agricultural Sales and Service 17
E. Conservation 17
F. Horticulture Produce Industry 17
G. Ornamental Horticulture 17

Bachelor of Science in Landscape Architecture

LANDSCAPE ARCHITECTURE CURRICULUM

The profession of landscape architecture offers the opportunity to be involved in improving the quality of the environment. The profession deals with the planning and sensitive design of land areas for the utility of man and the esthetic enrichment of his needs. This may range from the planning and design at the regional macro-scale to the urban micro-detail.

The primary educational goals of the curriculum are:

To prepare students who are professionally proficient and technically competent in the design of outdoor spaces for social interaction.

The education of students regarding the natural factors which influence the form and kind of development of use areas.

To introduce the students to the principles of land planning at all scales of development.

The curriculum exposes the student to a wide range of environmental design problems related to the satisfaction of man's social and physical needs. The program emphasizes the understanding of relationships between the natural and social systems and their manifestations in physical design form.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C) (A minimum of six credits in college mathematics to include trigonometry)	12
Engineering Sciences	2

Horticulture	3
Courses in Landscape Architecture*	54
Physical Education	2
Free Electives	33
Total	136

*In addition, each student will be required to work for at least one Summer or its equivalent in an approved landscape architecture office.

Courses of Instruction

Resource Management

180. *Assigned Topics.* I, II, S. 1-4 hr. In order to be eligible to register in Assigned Topics, the student must: (1) be in good standing, and (2) obtain approval of the Division before registration.

Agricultural Economics*

10. *Agribusiness Accounting.* I. 4 hr. Accounting for business managers who do not intend to become accountants. A brief coverage of terminology and methodology; decisions in accounting as directed by executives; interpretations and values from accounts and accounting statements. (Offered in Fall of even years.)

104. *Farm Management.* I. 3 hr. Principles in assembling, analyzing, and using farm business records; the use of budgeting in evaluating alternatives.

200. *Land Economics.* II. 3 hr. Classification, development, tenure, use, conservation, valuation, and taxation, of rural, urban, mineral, forest, water, and recreational land resources. Private and public rights in land and the effect of population on the demand for land.

206. *Farm Planning.* I. 3 hr. PR: Senior standing. Planning use of labor, soil, crops, livestock, buildings and equipment; principal factors influencing returns on farms. Farm visits required.

211. *Rural Economic Development.* I or II. 3 hr. Resource utilization, economic behavior and economic systems and subsystems, trade, public revenue and its allocation, distribution of income, manpower problems, development policies, and regionalization in rural areas.

231. *Marketing Agricultural Products.* II. 3 hr. Market organization, policies, practices, and factors affecting the marketing of agricultural products. Tour of market agencies and facilities in Pittsburgh area required.

235. *Marketing Dairy Products.* II. 2 hr. Milk-marketing policies and practices, including milk-market orders. (Offered in Spring of odd years.)

240. *Agricultural Prices.* I. 3 hr. Analysis of price-making forces which operate in the market places for the major agricultural commodities. A tour of marketing agencies and facilities may be made.

261. *Agribusiness Finance.* II. 3 hr. Credit needs for agricultural businesses, financing farm and market-agency firms, and organization and operation of credit agencies which finance agricultural business firms. (Offered in Spring of even years.)

*Econ. 51 or 54 is required as a prerequisite for all courses in Agricultural Economics numbered 100 or above.

271. *Agricultural Policy.* II. 3 hr. An examination of the economic aspects of governmental price programs, production and marketing controls, subsidies, parity, export and import policies, and other programs affecting agriculture. (Offered in Spring of odd years.)

330. *Cooperative Organization.* II. 3 hr. Organization, functions, and contributions of cooperatives in an economic system. (Offered in Spring of even years.)

342. *Advanced Agricultural Economics.* I. 3 hr. (Offered in Fall of even years.)

355. *Resource Analysis.* I. 3 hr. PR: Senior standing. Construction of models consistent with economic reality for allocating the factors of production available on farms, in forests, and in non-farm agricultural businesses to produce profit maximizing plans through use of linear and dynamic programming and electronic equipment.

Agricultural Education

Agr. Ed.

160. *Materials for and Method of High School Teaching of Vocational Agriculture.* I. 3 hr. PR: Consent. Organization and preparation for teaching vocational agriculture in and through the high school. (Also listed as C&I 160.)

162. *Group Organization and Leadership.* I. 2 hr. PR: Consent. Principles and techniques involved in forming, structuring, developing, and directing organizations for effective professional leadership.

188. *Student Teaching.* I, II. 8 hr. PR: C&I 7, Ed. Psych. 105 and 106. (See C&I 188 requirements.)

260. *Principles of Cooperative Extension.* I. 2 hr. PR: Consent. Background, philosophy, and history of cooperative extension. Activities of county cooperative extension agents and cooperative extension programs in West Virginia. (Offered in Fall of even years.)

261. *Methods and Materials in Extension Education.* II. 2 hr. PR: Consent. Organization and preparation for extension teaching and the processes of communication. (Offered in Spring of odd years.)

263. *Teaching Young, Adult Farmer, and Off-Farm Agricultural Occupations Classes.* I. 2 hr. PR: Ed. Psych. 105, 106 or consent. Participation in conducting young farmer, adult farmer, and off-farm agricultural occupations classes; organization, course of study, method in teaching, and supervision of classes, young farmers' associations, adult farmers' organizations, and off-farm agricultural occupations organizations. (Also listed as C&I 263.)

362. *Program Building in Cooperative Extension.* II. 3 hr. PR: Consent. Organization in relation to program building. Leadership and group action. Overall working and educational objectives, principles, method, and goals in developing county extension programs. (Offered in Spring of even years.)

364. *Organizing and Directing Supervised Farming and Supervised Occupational Experience Programs.* S. 2 hr. PR: Agr. Ed. 160 or consent. Planning programs of supervised farming and supervised occupational experience, supervising and evaluating such programs for day students, young farmer, adult farmer, and off-farm agricultural occupations classes and groups. (Also listed as C&I 364.)

Agricultural Mechanics

Agr. Mech.

10. *Principles of Agricultural Mechanics.* I. 3 hr. A study of the development of mechanized production and processing together with the impact of such mechanization on environment, utilization of natural and renewable resources, pollution, and their effect on ecology. 3 hr. rec.

152. *Shop Theory and Methods.* I. 3 hr. Six areas of basic shop work: carpentry and woodworking tools, cold metal work, hot metal work (forge, electric and gas welding), sheet metal work (soldering, forming, cutting, riveting), tool care and free-hand drawing. 1 hr. rec., 6 hr. lab.

253. *Advanced Farm Machinery.* II. 3 hr. Systems approach to selection, use, and operation of machinery as related to agriculture, forestry, and other rural activities. Emphasis on safety and environmental impact. Use of records for management decisions, purchase, replacement, sale, or overhaul. 2 hr. rec., 3 hr. lab.

259. *Farm Structures.* II. 3 hr. Study of structures required for agriculture, family housing, storage, and recreation. Includes function, planning, layout, materials, construction techniques, prefabrication, repair, remodeling, and costs. 2 hr. rec., 3 hr. lab.

270. *Electricity in Agriculture.* II. 3 hr. Study of production and safe use of electricity for home and agriculture. Emphasis on approved wiring practices, motors, and electrical controls and their applications in lighting, heating, refrigeration, air conditioning, water supply, and processing. 2 hr. rec., 3 hr. lab.

275. *Agricultural Engines.* I. 3 hr. Study of power sources (gasoline, diesel, turbine, wankel, etc.) for agriculture, forestry, and other rural activities. Operation, selection, record keeping, maintenance techniques, emissions impact on power and fuel efficiency, power trains, transmissions, and service procedures. 2 hr. rec., 3 hr. lab.

352. *Advanced Farm Mechanics.* S. 3 hr. PR: Agr. Mech. 152. Development of advanced skills with hand and power tools. Areas of emphasis dependent upon needs of individual students. Care and maintenance of power tools and shop organization and planning are essential parts of this course. 1 hr. rec., 6 hr. lab. (Offered Summer of every third year — next offering 1975.)

Landscape Architecture

L.A.

20. *Architectural Design.* I. 3 hr. Introduction to the architectural elements involving the expression of a variety of materials in two- and three-dimensional design.

21. *Architectural Design.* II. 3 hr. PR: Consent. A study of the expression of architectural and landscape architectural elements in two- and three-dimensions.

41. *Plants and Design.* II. 3 hr. PR: Consent. Laboratory and field study of woody and herbaceous plants and their use for compositional effects.

50. *Theory of Landscape Architectural Design.* I. 3 hr. PR: Consent. Introduction to basic theory and landscape design principles.

51. *Landscape Architectural Design.* II. 3 hr. PR: Consent. Problems in basic landscape design to acquaint the student with the various materials and to develop his capacity to design in the outdoor space.

112. *History of Landscape Architecture.* I. 3 hr. PR: Consent. A broad survey of the history of the designed human environment with emphasis on the development of landscape architecture. (Offered in even years.)

131. *Landscape Construction.* I. 3 hr. PR: Consent. Preparation of grading plans including specifications and cost estimates.

132. *Landscape Architectural Construction.* II. 3 hr. PR: Consent. Landscape structures, their use in design including selection and use of materials.

140. *Planting Design.* I. 3 hr. PR: Consent. Laboratory and field study of woody and herbaceous plants and their use of compositional effects.

141. *Planting Design.* II. 3 hr. PR: Consent. Continuation of L.A. 140.

150. *Landscape Architectural Design.* I. 4 hr. PR: Consent. Design problems involving private, public and semi-public areas with emphasis on plan analysis, detail and presentation. Problems are integrated with construction and plant materials.

151. *Landscape Architectural Design.* II. 4 hr. PR: Consent. Continuation of L.A. 150.

248. *Design Analysis.* II. 2 hr. PR: Consent. Analysis of planning and design projects with respect to offering solutions to a given problem. (Offered in Spring of odd years.)

250. *Landscape Architectural Design.* I. 5-7 hr. PR: L.A. 151 and/or consent. Advanced design; continuation of L.A. 150 and 151 with more comprehensive problems and in-depth collaborative study.

251. *Landscape Architectural Design.* II. 7 hr. PR: L.A. 250 or consent. Advanced comprehensive design problems, continuation L.A. 250 theme, but generally requiring individual work.

265. *Regional Design.* I. 3 hr. PR: Consent. Consideration of regional landscapes in order to effectively relate design to the ecology and development of a region. (Offered in Fall of odd years.)

276. *Recreation Planning.* I. 3 hr. PR: Consent. Design of park and recreation areas involving park history, classification theory, and administration.

284. *Professional Practice.* II. 2 hr. PR: Consent. Profession of landscape architecture involving procedures in preparation of contract documents, fees, estimates, operation of an office, and relationship to clients and contractors. (Offered in Spring of even years.)

College of

Arts and Sciences

Three classes of students enroll in the College of Arts and Sciences: students working toward a degree in the College; those pursuing a preprofessional curriculum in anticipation of earning a bachelor's degree in a professional school; and special students who are not degree candidates.

Students who have earned fewer than 58 hours of credit and have not entered a degree program are classified as lower-division students in the College. During the semester in which they will complete 58 or more hours of coursework, students in Arts and Sciences should apply for admission to degree programs in the college or department in which they intend to earn their degree. In the case of interdepartmental degree programs, application should be made to the Chairperson of the Interdepartmental Major Committee. If a student has not been admitted to a degree program by the time of completion of 70 hours of coursework, the student will not be permitted to re-enroll in the College of Arts and Sciences.

Admission to Degree Programs

Minimal College of Arts and Sciences requirements for regular admission into degree programs are completion of 58 hours of course credit, a 2.0 overall average, and a 2.0 average in courses already completed in the discipline of the degree program to which the student is applying. Specific degree programs may have additional requirements.

Students may be admitted to degree programs in Arts and Sciences in two distinct categories:

1. *Regular Admission.* Student has met all college and degree program requirements.

2. *Provisional Admission.* Student has completed 58 hours but has not yet met all college and/or degree program requirements for entrance into the specific program. It should be stated in writing, by the department offering the degree program, the provisional terms under which the student is accepted, making clear the deficiencies the student must remove and the date by which such removal must be accomplished. Failure on the part of the student to remove deficiencies by the stipulated date will result in suspension from the degree program.

Students planning to qualify for teacher certification as well as for an Arts and Sciences degree should check with their advisers and the *Catalog* statement (College of Human Resources and Education) to determine the requirements for such certification.

Complete information concerning WVU admissions, registration, fees and expenses, regulations, etc. may be found in Part 2 of this *Catalog.*

Admission to Degree Programs in College and Schools Other Than Arts and Sciences

Students planning on applying for admission to degree programs in other WVU colleges and schools should check the *Catalog* statements of those schools to determine the specific admission requirements. Students who have not been

admitted into another college or school by the time they have earned 70 hours of course credit cannot re-enroll in the College of Arts and Sciences unless they have been admitted into a degree program in the College of Arts and Sciences.

Education in Breadth and Education in Depth

In the first two years the student normally takes broad basic courses which serve as general education and courses which are preparatory to the specialized work for the major.

Work in the degree program provides intensive study in some one field which is designated as the student's major. It is based on the belief that an educated man or woman knows something of several branches of knowledge and knows at least one subject in depth. The student may also have one or two minor concentrations in the degree program.

Degree Programs

The following degree programs are offered:

Biology
Chemistry
Computer Science
Economics
English
French
Geography
Geology
German
History
Latin
Library Science
Mathematics
Philosophy
Physics
Political Science
Psychology
Russian
Sociology
Spanish
Speech Communication
Statistics

Interdepartmental Major

A student who wishes to pursue a study program that involves more than one major subject should consult with a faculty member in the department offering the greatest number of courses relevant to the proposed topic, and then with faculty members in one or more of the departments offering courses appropriate to the student's needs. After the area of concentration is delineated and faculty cooperation is assured, the student should submit a proposal for an interdepartmental major to the Interdepartmental Major Committee of the College (at the office of the Assistant Dean for Instruction).

The proposal should include: (a) a detailed statement of the area of concentration to be studied; (b) a listing of the courses that would constitute the program of study; (c) the reasons that the student wishes to pursue an interdepartmental major rather than an existing program already offered by one of the College's departments; and (d) a statement from the faculty members with whom the student has conferred, indicating that they have reviewed the proposal and agree to serve as an advisory committee with one of them designated as chairperson.

Further information may be obtained from the office of the Assistant Dean, College of Arts and Sciences.

Double Major

A student may earn a degree in more than one degree program if the student is officially accepted into each program and satisfies the requirements of each program.

Honors Program

The Honors Program at WVU exists through the cooperation of the departments which offer lower-division, general courses to selected students and which are now developing special programs for their majors. Honors sections are small enough to permit more discussion of the material and more individual attention by the instructor than exists in other classes.

A student in the Honors Program normally takes one honors course each semester of his first two years. Experiences in his junior and senior year depend upon the student's major department. Typically they involve independent study, participation in research activity, or enrollment in special topics. Being in the program also qualifies students for privileges such as stack permits at the library and counseling for graduate fellowships and scholarships. Further information may be obtained by writing Coordinator, Honors Program, Woodburn Hall.

Credit by Examination

Any student may petition to receive credit by examination for any course, except English 1 and 2, listed by a department as one for which credit by examination is awarded. Credit by examination for English 1 and 2 is available to only those students who are notified by the Coordinator of the Writing Programs in the Department of English of their eligibility for such examination. Applications, course lists, and examination schedules are available at the Academic Advising Center of the College of Arts and Sciences.

A student may apply for such credit in a course if (a) the student is at the time of examination registered in the University; (b) the student's official record does not show credit for the course the student wishes to take by examination (i.e. any grade of S, P, D, C, B, A, or I); (c) the student is not officially enrolled in the course at the time of examination. (A student who withdraws from a course after the end of the official registration period is officially enrolled in that course until the end of the semester in which the course was elected.)

Requirements for Degrees

Application for Graduation and Diploma

All candidates for degrees in the College of Arts and Sciences must fill out an application for graduation and diploma at the Academic Advising Center. Candidates should make such application during the second semester of their junior year in order to have their records evaluated as to College and University requirements. Application *must* be made at least one month before the end of the semester or term in which the candidate expects to be graduated. If a student does not, for some reason, graduate on the date for which the student applied initially, the student must re-apply for a later date. No candidate can be graduated without application.

Attendance at the spring Commencement is voluntary. If you don't plan to attend, leave the mailing address to which you want your diploma mailed at your dean's office.

Bachelor of Arts Degree

The Bachelor of Arts degree in the College of Arts and Sciences is conferred upon a student who complies with the general regulations of the University concerning degrees and satisfies all entrance, college, and departmental requirements.

Bachelor of Science Degree

The Bachelor of Science degree is conferred upon a student who complies with the general regulations of the University concerning degrees, satisfies all entrance and college requirements, and completes the requirements for the Bachelor of Science degree in one of the following fields: Chemistry, Computer Science, Geology, Physics, Statistics.

Second Bachelor's Degree

A student who has received a bachelor's degree in one department or college of WVU may become eligible for a second bachelor's degree by earning an additional 30 semester hours in residence in the College of Arts and Sciences and meeting all requirements, departmental and otherwise, of the second bachelor's degree.

Basic Requirements for All Degrees

I. *Physical Education.* Two hours of physical education, to be taken during the first year of residence, are required by WVU for graduation. The requirement is waived for transfer students entering WVU with 58 or more transfer credits, for physically handicapped students upon certification by a physician of the University Health Service, and for students having had at least one continuous year of military service.....2 hr.

II. *English Composition.* Each undergraduate must complete one year of English composition and rhetoric (English 1, 2) unless exempted from part or all of the requirement on the basis of test scores or other evidence of proficiency in composition.....6 hr.

III *Foreign Language.* Two years of study in one language. The student who presents two or more units of high school credit in a foreign language may satisfy this requirement by taking courses 3 and 4 or other approved courses in that language but will not receive credit toward the degree by taking courses 1 and 2 in that language. The student may take courses 1, 2, 3, and 4 in a different language for full credit. (For explanation of the various options and other approved courses, consult the listings under *Foreign Languages* in this *Catalog.*).....6-12 hr.

IV. *Core Curriculum Requirements.* The Core Curriculum requirements apply to all undergraduate students in the University. They are intended to insure that all students will encounter a broad spectrum of subject matter in their baccalaureate curricula. Each student must earn a minimum of twelve credit hours in each of the three Core groups, except that two four-credit courses and one three-credit course may be used to satisfy the requirement in any group. Credit must be earned in at least two subjects in each group.

Core A: Art, Drama, English (exclusive of 1, 2), Humanities, Foreign Languages and Literature (beyond credits submitted to meet the foreign language requirement III, above), Music, Philosophy, Religious Studies, Selected Multi-Disciplinary Studies, Speech Communication.....12 hr.

Core B: Economics, Forestry 140, Geography, History, Political Science, Psychology, Selected Multi-Disciplinary Studies, Social Science, Sociology and Anthropology.....12 hr.

Core C: Bacteriology, Biology, Chemistry, Entomology, Genetics, Geology, Mathematics, Nutrition, Physical Science, Physics/Astronomy, Physiology, Selected Multi-Disciplinary Studies, Statistics.....12 hr.

In satisfying the Group C requirements, the Arts and Sciences student must have laboratory experience. The College strongly recommends a full year in one science.

V. *Degree Program Departmental Requirements* in the major subject. A *minimum* of 18 upper-division hours in the major subject is required. (Courses number 100 and above.)

VI. *Electives,* as approved by the adviser, to complete the minimum number of hours required for graduation.

VII. *Grade-Point Average.* An overall grade-point average of at least 2.0 is required for courses attempted in the major subject. Individual departments may require a grade of C or higher for certain specified required courses. A cumulative average of 2.0 is required for graduation.

To establish a major sequence and to qualify for graduation, the student must have spent at least two semesters and have accumulated a minimum of 30 semester hours as a student in a degree program.

Except with the approval of the department chairperson, no upper-division course in the major, taken at another institution, will be counted toward meeting the requirements of the degree program.

Regulations Affecting Degrees

A total of 128 hours is required for the Bachelor of Arts degree. The Bachelor of Science degree in Computer Science, Geology, and Statistics requires 134 hours; in Chemistry and Physics, 136 hours.

The following may *not* be counted toward the hours required for graduation:

(a) Foreign Language courses 1 and 2 (or 21, 22, or 31, 32) if the student has presented two or more units of high school credit in the same language.

(b) Fewer than 6 hours in Foreign Language courses numbered 1 and 2 (or 21, 22, or 31, 32) unless additional work in the same language is offered.

(c) Mathematics 0, 1, 2.

(d) Courses in which the grade received is other than A, B, C, D, P, or S. Credit by examination, however, is counted toward hours required for graduation unless it was granted for courses otherwise excluded in this list.

(e) Any course passed more than once, unless a course is designated as repeatable and is so described in the *Catalog.*

(f) More than 42 hours in one departmental subject for a Bachelor of Arts degree. (In the case of English language and literature, the 42-hour maximum is exclusive of credits in English 1 and 2.) As much as 60 hours may be presented from a department that offers more than one subject (e.g. Foreign Languages).

(g) More than 8 hours of first- and second-year Military Science (ROTC) or Air Force Aerospace Studies (ROTC) courses.

(h) More than 6 hours of third- and fourth-year Military Science (ROTC) or Air Force Aerospace Studies (ROTC) courses.

(i) More than 72 hours of transfer credit from accredited junior colleges.

(j) Courses completed in a junior college subsequent to attaining junior or higher rank by the student at WVU.

(k) More than 16 semester hours of credit for which only a grade of P is recorded.

In addition to (1) work conducted by other faculties but recognized as a regular part of the program of the College of Arts and Sciences, (2) work offered

toward fulfillment of the Core Curriculum, and (3) non-Education courses required for teacher certification, a student may establish credit not to exceed 24 semester hours in approved courses outside the College. The credit that may be transferred from any one college or school shall not exceed 21 hours in Education and 15 hours in any other one college or school. Under this provision, clinical and skill courses taken in other schools or colleges will not be accepted for credit in the College of Arts and Sciences.

Preparation for the Study of Dentistry, Law, or Medicine

Students preparing for the study of dentistry or medicine may satisfy the requirements for entrance into dental or medical school by majoring in any Arts and Sciences subject and including in their undergraduate course selections the following or their equivalents: Biol. 1, 2 (8 hr.); Chem. 15, 16, 133-135, 134-136 (16 hr.); Physics 1, 2 (8 hr.); and social studies (6 hr.). These requirements overlap those of the Core Curriculum, which must be satisfied by all students. All departments in Arts and Sciences offer a major which accommodates the above courses. Some students are admitted to a school of dentistry or medicine after completing three years of undergraduate work. These students may earn the bachelor's degree by completing three years in Arts and Sciences and one year in a dental or medical school only if they major in one of the sciences. In some cases, courses taken in the first year of dental or medical school may be credited to the degree program in Arts and Sciences.

No specific program of pre-law education is prescribed. Courses of study which demand intellectual self-discipline are encouraged. The ability to speak and write clearly, ordering thoughts intelligently, and using language accurately is highly desirable. Some background in accounting is helpful in understanding complex tax and corporate structure matters.

Bureau for Government Research

The Bureau for Government Research makes studies of problems of state and local government, provides consulting assistance to West Virginia governments, presents training programs for government officials, and issues publications periodically.

O. B. Conaway, Jr., Ph.D. (Syracuse U.), *Director.*
Ralph F. Garn, Ph.D. (U. Tenn.), *Research Associate.*
Allan S. Hammock, Ph.D. (U. Va.), *Research Associate.*
Herman Mertins, Jr., Ph.D. (Syracuse U.), *Research Associate.*
William R. Ross, M.A. (WVU), *Research Associate.*
David G. Temple, Ph.D. (U. Va.), *Research Associate.*
David G. Williams, Ph.D. (SUNY), *Research Associate.*

Courses of Instruction and Curricula

Orientation

Orien.

1. *Orientation.* 1 hr. Open only to new students in their first semester at the University. Study of the values, orientation, and emphases which characterize higher education and an explanation of the nature of a university and its role. (Pass-Fail credit only.)

191. *Orientation.* 1 hr. PR: Sophomore or higher standing and consent. Students will participate in Orien. 1 as assistants to faculty teaching Orien. 1. Practicum form of study leading to an understanding of the values, orientations, and emphases which characterize higher education. (Pass-Fail credit only.)

Biology

Faculty

E. C. Keller, Jr., Ph.D. (Penn. St. U.), *Chairperson and Professor of Biology.*
Lila Abrahamson, Ph.D. (U. Mich.), *Associate Professor of Biology.*
Robert D. Allen, Ph.D. (UCLA), *Assistant Professor of Biology.*
Nelle P. Ammons, Ph.D. (U. Pitt.), *Professor Emeritus of Botany.*
Charles H. Baer, Ph.D. (U. Md.), *Associate Professor of Biology.*
Elizabeth A. Bartholomew, M.S. (WVU), *Instructor in Biology; Curator of Herbarium.*
Jay Barton II, Ph.D. (U. Mo.), *Professor of Biology; Provost—Instruction.*
Herald D. Bennett, Ph.D. (U. Iowa), *Professor of Biology.*
Arnold Benson, M.A. (U. Colo.), *Assistant Professor of Biology.*
Robert L. Birch, M.S. (Penn. St. U.), *Assistant Professor of Biology.*
David F. Blaydes, Ph.D. (Ind. U.), *Associate Professor of Biology.*
W. Newman Bradshaw, Ph.D. (U. Tex.), *Professor of Biology.*
Kathleen P. Brooks, Ph.D. (U. Calif.), *Instructor (part-time) in Biology.*
Roy B. Clarkson, Ph.D. (WVU), *Professor of Biology; Associate Chairperson.*
Jesse F. Clovis, Ph.D. (Cornell U.), *Professor of Biology.*
William E. Collins, Ph.D. (U. Wisc.), *Associate Professor of Biology.*
Mullen O. Coover, M.S. (WVU), *Associate Professor of Biology.*
Earl L. Core, Ph.D. (Columbia U.), *Professor Emeritus of Biology.*
John J. DeCosta, Ph.D. (Ind. U.), *Associate Professor of Biology.*
Dorothy Covalt Dunning, Ph.D. (Tufts U.), *Assistant Professor of Biology.*
Ramsey H. Frist, Ph.D. (U. Pitt.), *Associate Professor of Biology.*
Lloyd R. Gribble, Ph.D. (WVU), *Professor Emeritus of Zoology.*
Roland L. Guthrie, Ph.D. (WVU), *Associate Professor of Biology; Arboretum Director.*
John E. Hall, Ph.D. (Purdue U.), *Adjunct Professor of Biology.*
Willis H. Hertig, Jr., Ph.D. (WVU), *Associate Professor of Biology.*
Henry W. Hurlbutt, Jr., Ph.D. (U. Md.), *Associate Professor of Biology.*
Norman E. Kowal, Ph.D. (Duke U.), *Adjunct Assistant Professor of Biology.*
Joseph A. Marshall, Ph.D. (U. Md.), *Associate Professor of Biology.*
Ethel C. Montiegel, M.S. (WVU), *Associate Professor of Biology.*
Charles Norman, Ph.D. (U. Iowa), *Professor of Biology.*
Martin W. Schein, Sc.D. (J. Hopkins U.), *Centennial Professor of Biology.*
Robert C. Spangler, Ph.D. (U. Chicago), *Professor Emeritus of Botany.*
Jerry E. Squires, Ph.D. (Yale U.), *Assistant Professor of Biology.*
Richard P. Sutter, Ph.D. (Tufts U.), *Associate Professor of Biology.*
Leland H. Taylor, Sc.D. (Harvard U.), *Professor Emeritus of Zoology.*
Leah A. Williams, Ph.D. (WVU), *Assistant Professor of Biology.*

Programs

The Bachelor of Arts degree with a major in Biology is designed to prepare students for professional careers in the life sciences. The required courses of the major provide preparation for graduate study in many of the specialized biological disciplines; for professional study in medicine, dentistry, or other health-

related sciences; for secondary school teaching; and for careers in government and private industry.

Off-campus field experience in various aspects of terrestrial and freshwater biology and marine biology are available in the summer at three off-campus sites: Terra Alta Biological Station, the Lewes (Del.) Marine Station, and the Wallops Island (Va.) Marine Station. Information regarding these programs may be obtained by contacting the Chairperson, Department of Biology.

Admission to the degree program requires at least a cumulative average of 2.0 for courses in biology taken at WVU.

Major in Biology

Required Courses

Lower Division (31 hours minimum)
- Biology 1, 2
- Chemistry 15, 16
- Physics 1, 2
- Mathematics 3, 4 (may be waived on the basis of ACT test scores)
- Mathematics 15, 16 (Statistics or Computer Science may be substituted for Math. 16)

Upper Division (40 hours minimum)
- Chemistry 133, 134, 135, 136
- Biology 101, 102, 103, 104
- 7-8 hours of Biology electives

Minimum hours in Biology required of majors is 31. These required upper-division electives may be selected from courses (other than Biol. 91) listed in Courses of Instruction in Biology. At least one of these electives must be a laboratory course. With the adviser's approval, courses in the College of Agriculture and Forestry and School of Medicine may be selected to satisfy this elective requirement. The student should consult with the adviser in choosing these required biology electives and those general electives which satisfy both University and College requirements.

Honors Program

Admission requirement for this program is a 3.4 overall average. Enrollment in the first semester freshman honors course is by invitation before the students' freshman enrollment. A qualified student may apply for enrollment in the program after the first semester. Instructors and advisers in biology may recommend to the Honors Committee those students who meet the admission standards. Interested students who qualify should consult with their advisers about the program. The Honors Program in Biology is structured to provide the student with a wide variety of opportunities. Individual original research, a senior thesis, and seminar are a required part of the program. Other activities, such as study in a research laboratory on another campus, teaching apprenticeships, or study abroad, are encouraged.

Courses of Instruction in Biology

Biol.

1. *General Biology.* I, II, S. 4 hr. Introductory course in biology: cellular, physiological, regulatory, taxonomic aspects of biology. (Lab fee $10.00.)

2. *General Biology.* I, II, S. 4 hr. Introductory course in biology: genetic, ecological, behavioral, developmental, and contemporary aspects of biology. (Lab fee $10.00.)

51. *Dendrology (Angiosperms).* I. 2 hr. PR: Biol. 1 and 2 or equiv. Classification and distribution of the angiosperm timber trees of the United States. Primarily for forestry students. (Lab fee $10.00.)

52. *Dendrology (Gymnosperms).* II. 1 hr. PR: Biol. 1 and 2 or equiv. Classification and distribution of the gymnosperm timber trees of the United States. Primarily for forestry students.

91. *Man and His Environment.* I. 3 hr. An examination of some of the facets of the environment which most directly affect human welfare. Central focus on environmental deterioration and corrective public policies. An interdisciplinary, non-prerequisite course for all students in the University. (Also listed as Social Science 91.)

101. *Animals As Organisms.* I. 4 hr. PR: Biol. 1 and 2 or equiv. The organism — development, structure, function, and evolution. Dissection kit required. (Lab fee $15.00.)

102. *Plants As Organisms.* II. 4 hr. PR: Biol. 1 and 2 or equiv. Integrated study of the organism — development, structure, function, and evolution. (Lab fee $20.00.)

103. *Population Biology.* I. 4 hr. PR: Biol. 1 and 2, Math. 4, or consent. Biological populations and their environmental relationships. (Lab fee $10.00.)

104. *Cellular and Molecular Biology.* II. 4 hr. PR: Biol. 1 and 2, general physics, organic chemistry, or consent. A study of cell structure and function beginning at the molecular level of organization and proceeding through different levels of complexity. (Lab fee $20.00.)

105. *Honors Investigation.* II. 3 hr. PR: Second semester of junior year, recommendation of adviser; biology majors only. Supervised readings, investigation, and study.

106. *Honors Investigation.* I. 3 hr. PR: Biol. 105. Supervised readings, investigation, and study.

107. *Honors Thesis.* II. 3 hr. PR: Biol. 106. Supervised readings, investigation, and study.

151. *Plant Systematics.* II. 4 hr. Classification, ecology, and identifications of local vascular plants. (Lab fee $10.00.)

152. *The Plant Kingdom.* II, S. 4 hr. PR: Biol. 1 and 2 or equiv. Study of the evolution, structure, and development of plants beginning with simple plants and proceeding through various levels of complexity to the flowering plants. (Not open to students having credit for Biol. 351, 352.) (Lab fee $10.00.)

169. *Plant Physiology.* I, II. 3 hr. PR: Chem. 15 and 16, or equiv. Physiochemical processes of plants. (Lab fee $15.00.)

201. *History of Biology.* I. 3 hr. PR: Biol. 1 and 2 or equiv. History of development of biological knowledge, with philosophical and social backgrounds.

209. *Topics and Problems in Biology.* I, II, S. 1-4 hr. PR: Consent. Topics and problems in contemporary biology. All topics or problems must be determined in consultation with the instructor.

211. *Life Cycle of the Cell.* I. 4 hr. PR: Biol. 104. Advanced study of fundamental cellular activities and their underlying molecular processes. (Lab fee $15.00.)

215. *Cytology.* II. 4 hr. PR: Biol. 1 and 2 or equiv. Cells, their structure and function. (Lab fee $10.00.)

231. *Behavior of Organisms.* I. 3 hr. PR: Biol. 1 and 2 or equiv. Principles of individual and group behavior. (Lab fee $15.00.)

243. *Plant Ecology.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Environmental and ecological relationships of plants. (Lab fee $10.00.)

246. *Limnology.* I. 4 hr. PR: Biol. 103 or consent. Physical, chemical, and biological characteristics of inland waters with an introduction to the principles of biological productivity. (Lab fee $10.00.)

251. *Principles of Evolution.* I, S. 3 hr. PR: Biol. 1 and 2 or equiv. Introduction to the study of evolution.

252. *Flora of West Virginia.* II, S. 3 hr. PR: Biol. 1 and 2 or equiv. Consideration of native plant life of the state.

253. *Plant Anatomy.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Anatomy of seed plants. (Lab fee $10.00)

254. *Plant Geography.* II. 3 hr. PR: Biol. 1 and 2 or equiv. Study of plant groupings and worldwide distribution of plants.

255. *Invertebrate Zoology.* II. 4 hr. PR: Biol. 1 and 2 or equiv. Advanced study of animals without backbones. (Lab fee $10.00.)

256. *Ornithology.* II. 3 hr. PR: Biol. 1 and 2 or equiv. Lecture and laboratory studies on ancestry, evolution, topography, anatomy and physiology, systematics, behavior, migration, and ectoparasites of birds. Field studies will be limited in scope.

257. *Ichthyology.* II. 3 hr. PR: Biol. 101 or consent. Internal and external structure of fishes, their systematic and ecological relationships, and their distribution in time and space. Dissection kit required. (Lab fee $10.00.)

259. *General Parasitology.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Introduction to the biology of parasites. Dissection kit required. (Lab fee $10.00.)

261. *Comparative Anatomy.* I. 5 hr. PR: Biol. 101 or equiv. A comparative study of the morphology of selected vertebrates emphasizing functional and evolutionary relationships. Dissection kit required. (Lab fee $15.00.)

262. *Vertebrate Embryology.* II. 5 hr. PR: Biol. 1 and 2, 101 or equiv. Experimental and descriptive approach to the study of the development of vertebrates. (Lab fee $15.00.)

263. *Vertebrate Microanatomy.* II. 5 hr. PR: Biol. 101 or 261. The structural and functional approach to the study of the tissues and organs of vertebrates. (Lab fee $10.00.)

264. *Comparative Developmental Anatomy.* II. 3 hr. PR: Biol. 261. Anatomy and development of the organs and systems of various vertebrates.

265. *Comparative Neuroanatomy.* II. 4 hr. PR: Biol. 101 or 261 and consent. Comparative study of development and anatomy of the nervous systems of the vertebrates. Dissection kit required. (Lab fee $15.00.)

266. *Human Physiology.* I, II, S. 4 hr. PR: Biol. 1 and 2 or consent. Introductory course in the function of man. (Lab fee $10.00.)

267. *Comparative Physiology.* II. 4 hr. PR: Biol. 101 or 266 (or equiv. physiology course) or consent. Study of the diverse ways in which different kinds of animals meet their functional requirements. (Lab fee $20.00.)

268. *Physiology of the Endocrines.* I. 3 hr. PR: Biol. 101 or 266, or equiv., organic chemistry or consent. Regulation of the organs of internal secretions and mechanisms of action of the hormones produced.

269. *Physiology of the Endocrines — Laboratory.* I. 1 hr. PR or Conc.: Biol. 268. Experimental techniques used in study of the endocrine system. (Lab fee $15.00.)

309. *Topics in Biology.* I, II, S. 1-4 hr. PR: Consent. Topics in contemporary biology. Topic will be selected by instructor for formal presentation.

311. *Biology Seminar.* I, II. 1 hr. Discussions and presentations of general interest to biologists.

313. *Problems in Biology.* I, II, S. 1-4 hr. PR: Consent. Problems in contemporary biology. Selection of problem to be determined in consultation with instructor.

314. *Topics in Cellular and Molecular Biology.* I, II, S. 1-4 hr. PR: Consent. Topics in contemporary cellular and molecular biology. Topic will be selected by the instructor for formal presentation.

316. *Seminar in Cellular and Molecular Biology.* I, II. 1 hr. Selected areas of cellular and molecular biology.

322. *Topics in Bioscience Education.* I, II, S. 1-4 hr. PR: Consent. Topics in contemporary biology. Topics will be selected by the instructor for formal presentation.

323. *Seminar in Bioscience Education.* I, II. 1 hr. Selected areas of bioscience education.

333. *Behavioral Ecology.* I. 4 hr. PR: Biol. 103 and 231 or consent. Discussion of the influences of external environmental factors on the regulation and control of behavior.

338. *Seminar in Animal Behavior.* I, II. 1 hr. Selected areas of animal behavior.

339. *Problems in Animal Behavior.* I, II, S. 1-4 hr. PR: Consent. Problems in contemporary animal behavior. Selection of topics to be determined in consultation with the instructor.

342. *Primary Production in Aquatic Environments.* II. 3 hr. PR: Biol. 246 or consent. Lectures and discussions on the methods of measuring primary production and the integration of results of modern studies into ecosystem dynamics.

343. *Plant Communities.* S. 3 hr. PR: Biol. 1 and 2 or equiv. Field studies in the plant ecology of the central Appalachians.

345. *Fisheries Science.* II. 4 hr. PR: Biol. 257 or consent. Population dynamics in relation to principles and techniques of fish management.

346. *Dynamics of Ecosystems.* II. 3 hr. PR: Biol. 103 or consent. Modern concepts in ecology covered through discussion of readings. Topics treated are selected from the areas of population genetics, energy flow, nutrient cycling, and community structure.

347. *Seminar in Ecology.* I, II. 1 hr. Selected areas of ecology are presented and discussed.

348. *Topics in Ecology.* I, II, S. 1-4 hr. PR: Consent. Topics in contemporary ecology. Topic will be selected by the instructor for formal presentation.

349. *Problems in Ecology.* I, II, S. 1-4 hr. PR: Consent. Problems in contemporary ecology. Selection of problems to be determined in consultation with the instructor.

350. *Biosystematics.* I. 3 hr. PR: Biol. 1 and 2 or equiv. Techniques, history, and principles of the systematics of plants and animals.

351. *Plant Morphology (Algae and Fungi).* I. 4 hr. PR: Biol. 1 and 2 or equiv. Development and structure of algae and fungi.

352. *Plant Morphology (Bryophytes and Vascular Plants).* II. 4 hr. PR: Biol. 1 and 2 or equiv. Development and structure of the bryophytes and vascular plants.

353. *Taxonomy of Vascular Plants.* S. 3 hr. PR: Biol. 1 and 2 or equiv. Field studies in the taxonomy of higher plants.

354. *Fresh-Water Algae.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Taxonomy, cytology, and ecology of the aquatic, aerial, and land forms of fresh-water algae.

355. *Advanced Plant Systematics I.* I. 3 hr. PR: Biol. 151 or equiv. Taxonomy of pteridophytes, gymnosperms, and monocotyledons.

356. *Advanced Plant Systematics II.* II. 3 hr. PR: Biol. 151 or equiv. Taxonomy of dicotyledons.

357. *Aquatic Seed Plants.* I. 3 hr. PR: Biol. 1 and 2 or equiv. Classification, ecology, and identification of aquatic vascular plants.

358. *Field Study of Invertebrates.* S. 3 hr. PR: Biol. 1 and 2 or equiv. Taxonomy and ecology of invertebrates.

359. *Field Study of Vertebrates.* S. 3 hr. PR: Biol. 1 and 2 or equiv. Taxonomy and ecology of vertebrates.

360. *Vascular Cryptogams.* II. 4 hr. PR: Biol. 1 and 2 or equiv. Taxonomy, anatomy, cytology, and ecology of the club mosses, horsetails, and ferns.

362. *Developmental Biology.* I. 3 hr. PR: Biol. 101, 102, 262 or equiv. and organic chemistry. The molecular and cellular basis of differentiation and morphogenesis.

364. *Advanced Plant Physiology.* I, II. 3 hr. PR: Biol. 169 or equiv., organic chemistry, general physics, and consent. Advanced studies of plant processes including recent advances in the field. I. Second Semester, odd-numbered years — Water relations and mineral nutrition and translocation. II. First Semester, odd-numbered years — Plant growth and development. III. Second Semester, even-numbered years — Environmental physiology.

366. *Plant Development.* II. 4 hr. PR: Biol. 102, organic chemistry or biochemistry. Experimental studies of plant growth and development.

367. *Topics in Developmental Biology and Physiology.* I, II, S. 1-4 hr. PR: Consent. Topics in contemporary developmental biology and physiology. Topic will be selected by instructor for formal presentation.

368. *Problems in Developmental Biology and Physiology.* I, II, S. 1-4 hr. PR: Consent. Problems in contemporary developmental biology and physiology. Selection of problems to be determined in consultation with instructor.

369. *Seminar in Developmental Biology and Physiology.* I, II. 1 hr. Selected areas of developmental biology and physiology.

390. *Seminar in Systematic and Evolutionary Biology.* I, II. 1 hr. per sem. PR: Consent. Selected areas of systematic and evolutionary biology.

391. *Topics in Systematics.* I, II, S. 1-4 hr. PR: Consent. Topics in contemporary systematics. Topic will be selected by instructor for formal presentation.

Chemistry

Faculty

William R. Moore, Ph.D. (U. Minn.), *Chairperson and Professor.*
Richard E. Bowen, Ph.D. (WVU), *Instructor.*
William L. Clements, M.S. (WVU), *Instructor.*
Gabor B. Fodor, Ph.D. (U. Szeged, Hungary), *Centennial Professor.*
John A. Gibson, Jr., Ph.D. (MIT), *Professor Emeritus.*
John Gruninger, Ph.D. (U. Penn.), *Assistant Professor.*
George A. Hall, Jr., Ph.D. (Ohio St. U.), *Associate Professor.*
James L. Hall, Ph.D. (U. Wisc.), *Professor.*
James B. Hickman, Ph.D. (Penn. St. U.), *Professor.*
George L. Humphrey, Ph.D. (Ore. St. U.), *Professor and Associate Chairperson.*
Charles L. Lazzell, Ph.D. (Yale U.), *Professor Emeritus.*
A. Campbell Ling, Ph.D. (U. London), *Associate Professor.*
C. Gordon McCarty, Ph.D. (U. Ill.), *Associate Professor.*
B. Jack McCormick, Ph.D. (Okla. St. U.), *Professor.*
Denis W. H. MacDowell, Ph.D. (MIT), *Professor.*

Joseph T. Maloy, Ph.D. (U. Tex.), *Assistant Professor.*
Chester W. Muth, Ph.D. (Ohio St. U.), *Professor.*
Armine D. Paul, Ph.D. (U. Calif.), *Associate Professor.*
Cortlandt Pierpont, Ph.D. (Brown U.), *Assistant Professor.*
Peter Popovich, Ph.D. (Wash. St. U.), *Professor.*
John H. Strohl, Ph.D. (U. Wisc.), *Associate Professor.*
Vincent J. Traynelis, Ph.D. (Wayne St. U.), *Professor.*
Anthony Winston, Ph.D. (Duke U.), *Associate Professor.*
John C. Wright, Ph.D. (U. Ill.), *Dean, College of Arts and Sciences; Professor.*

Major in Chemistry — B.S.

The Bachelor of Science degree in chemistry is designed for those students who desire to qualify for professional positions in industry and governmental services as well as those who plan to do graduate work in chemistry. Requirements for the Bachelor of Science degree are listed below. Electives must be chosen so as to meet the basic requirements of the College of Arts and Sciences. A total of 136 hours is required, subject to the general course exclusions for all degrees. A second language, French or Russian, is recommended. Students wishing to pursue an honors program may include 4 to 6 hours of Chem. 194 as chemistry electives.

After admission to the program, continuance for the third and subsequent semesters requires a cumulative average of 2.0 for courses in chemistry taken in this department.

Required Courses

Chem. 17 and 18, or Chem. 15, 16, and 115; Chem. 101, 133, 134, 135, 136, 143, 144, 145, 146, 210, 222, 235, 242; Math. 15, 16, 17; Physics 11, 12; German 121, 122.

Recommended Electives

Chem. 211, 220, 237, 239, 243, 244, 245, 331, 332, 341; Stat. 213; Physics 125, 126; Math. 113, 214; Agr. Biochem. 210; Comp. Sci. 1; I.E. 181.

Major in Chemistry — A.B.

The course requirements for the Bachelor of Arts degree with a major in chemistry are designed to meet the needs of those students who desire to go into careers which require a good background in the basic principles of chemistry. Areas such as medicine, dentistry, or other health-related sciences, secondary school teaching, or chemical laboratory technical work, may be pursued by proper choice of electives.

After admission to the program, continuance for the third and subsequent semesters requires a cumulative average of 2.0 for courses in chemistry taken in the department.

Required Courses

Chem. 15, 16 and 115, or Chem. 17 and 18; Chem. 133, 134, 135, 136, 141; Physics 1, 2; Math. 3, 4 (or 4 hours calculus); Biol. 1, 2.

Recommended Electives

Chem. 211, 235, 239, 243, 244, 245, 331, 332; Math. 15, 16, 17; Agr. Biochem. 210; Comp. Sci. 1.

Honors Program

To be eligible for admission to the departmental Honors Program, a student must have a 3.5 average in chemistry courses taken at WVU, and must have the endorsement of the chemistry faculty.

A student may apply for initial admission to the program at any time after his first semester and no later than three semesters prior to graduation.

Application will be made to the departmental adviser who will serve as temporary adviser to the student.

A student re-entering the program, after having been out of it for a period of time, may in some cases be allowed to re-enter as late as his last semester in residence.

Courses of Instruction in Chemistry

Note: A charge is made for excessive breakage in laboratory courses in addition to the nonrefundable laboratory fee listed.

Chem.

Lower Division

11. *Survey of Chemistry.* I. 4 hr. Designed primarily for students taking only one year of college chemistry. Atomic structure; chemical bonding; acids, bases, and salts; periodicity; properties of gases, liquids, and solids; stoichiometry; oxidation-reduction. 2 hr. lect., 1 hr. rec., 3 hr. lab. (Lab fee $10.00.)

12. *Survey of Chemistry.* II. 4 hr. PR: Chem. 11. Continuation of Chem. 11. Nuclear chemistry; air and water pollution; useful natural materials; consumer chemistry; introduction to organic and biochemistry. 2 hr. lect., 1 hr. rec., 3 hr. lab. (Lab fee $10.00.)

15. *Fundamentals of Chemistry.* I, II. 4 hr. PR: English 1 and Math. 2 or equiv. or Conc. For students who need more than one year of college chemistry and for students in engineering. Develops terminology, conceptual foundations, and quantitative relationships on which subsequent courses in chemistry will be built. 2 hr. lect., 1 hr. rec., 3 hr. lab. (Lab fee $10.00.)

16. *Fundamentals of Chemistry.* I, II. 4 hr. PR: Chem. 15. Continuation of Chem. 15. 2 hr. lect., 1 hr. rec., 3 hr. lab. (Lab fee $10.00.)

17. *Principles of Chemistry.* I. 5 hr. PR: High school chemistry and Conc.: Math. 3. A more advanced treatment of the principles and theories of chemistry than offered in Chem. 15 and 16. Primarily for students specializing in chemistry. 3 hr. lect., 1 hr. rec., 3 hr. lab. (Lab fee $10.00.)

18. *Principles of Chemistry.* II. 5 hr. PR: Chem. 17. Continuation of Chem. 17. 2 hr. lect., 1 hr. rec., two 3 hr. lab. (Lab fee $10.00.)

Upper Division

101. *Chemical Literature.* I. 2 hr. PR: Organic chemistry. Study of techniques of locating, utilizing, and presenting information needed by the research workers in chemistry. 2 hr. lect.

115. *Introductory Analytical Chemistry.* I, II. 4 hr. PR: Chem. 16. Volumetric analysis, gravimetric analysis, solution equilibria, spectrophotometry, separations, and electrochemical methods of analysis. 2 hr. lect., two 3 hr. lab. (Lab fee $15.00.)

131. *Organic Chemistry: Brief Course.* II. 4 hr. PR: Chem. 16. Emphasis on biological applications for students in medical technology, agriculture, and family resources. Nomenclature, structure, reactivity, and stereochemistry are stressed. 3 hr. lect., 3 hr. lab. (Lab fee $15.00.)

133. *Organic Chemistry.* I, II. 3 hr. PR: Chem. 16 or 18 and 135 or concurrent enrollment. Basic principles of organic chemistry. Modern structural concepts, the effect of

structure on physical and chemical properties, reactions and their mechanisms and application to syntheses. 3 hr. lect.

134. *Organic Chemistry.* I, II. 3 hr. PR: Chem. 133, 135, and 136 or concurrent enrollment. Continuation of Chem. 133. 3 hr. lect.

135. *Organic Chemistry Laboratory.* I, II. 1 hr. PR or Conc.: Chem. 133. Fundamental organic reactions and the preparation of organic compounds. 3 hr. lab. (Lab fee $20.00.)

136. *Organic Chemistry Laboratory.* I, II. 1 hr. PR: Chem. 133, 134, and 135 or concurrent enrollment. Continuation of Chem. 135. 3 hr. lab. (Lab fee $20.00.)

141. *Physical Chemistry: Brief Course.* I, II. 4 hr. PR: Chem. 16, Math. 4. Beginning physical chemistry covering the subjects of chemical thermodynamics, chemical dynamics, and the structure of matter. 3 hr. lect., 3 hr. lab. (Lab fee $15.00.)

143. *Physical Chemistry.* I. 3 hr. PR: Chem. 18 or 115, Math. 16, and Physics 12. A first course in physical chemistry. Topics include a study of thermodynamics and chemical equilibria. 3 hr. lect.

144. *Physical Chemistry.* II. 3 hr. PR: Chem. 143 and Math. 17. Continuation of Chem. 143. Chemical dynamics and the structure of matter. 3 hr. lect.

145. *Physical Chemistry Laboratory.* I. 1-2 hr. PR or Conc.: Chem. 143. Experimentation illustrating the principles of physical chemistry and offering experience with chemical instrumentation. One or two 3-hr. lab. (Lab fee $20.00.)

146. *Physical Chemistry Laboratory.* II. 1-2 hr. PR: Chem. 143, 144, 145 or concurrent enrollment. Continuation of Chem. 145. One or two 3-hr. lab. (Lab fee $20.00.)

192. *Undergraduate Research.* I, II. 1-3 hr. PR: Written consent and a 3.0 grade-point average in chemistry courses. Individual investigations under supervision of an instructor. 3 to 9 hr. lab. (Lab fee $20.00.)

194. *Honors Course.* I, II. 1-3 hr. PR: Written consent and at least a 3.5 average in chemistry courses taken in the department. Research for students in the honors program. Thesis required. (Lab fee $20.00.)

202. *Selected Topics.* I, II. 1-3 hr. PR: Written consent, with at least a 2.0 grade-point average in chemistry courses. Individual instruction under supervision of an instructor. (Lab fee $20.00.)

210. *Instrumental Analysis.* II. 3 hr. PR: Chem. 143, 235. Basic instrumentation of analytical measurements. Electronics and instrument design. Methods of electrochemical and spectrochemical analysis. 2 hr. lect., 3 hr. lab. (Lab fee $20.00.)

211. *Intermediate Analytical Chemistry.* I. 3 hr. PR: Physical chemistry. Principles of analytical procedures and separations at an advanced level. 2 hr. lect., 3 hr. lab. (Lab fee $20.00.)

220. *Techniques of Chemical Syntheses.* II. 2 hr. PR or Conc.: Chem. 222. Preparation and handling of inorganic and organic materials. Inert atmosphere, vacuum system, high temperature and pressure, crystallization, distillation, sublimation, chromatography, non-aqueous solvents, and microscopy. Two 3-hr. lab. (Lab fee $20.00.)

222. *Chemistry of Inorganic Compounds.* II. 3 hr. PR: Chem. 242. Correlation of reactions and properties of elements and compounds based on modern theories of chemical bonding and structure. Acid-base theory, non-aqueous solvents, ligand field theory, and stereochemistry. 3 hr. lect.

235. *Methods of Structure Determination.* I. 4 hr. PR: Chem. 134 and 136. Use of chemical methods and u.v., ir., n.m.r., e.s.r., Raman and mass spectroscopy to elucidate structures of organic compounds. For students in chemistry and related fields who may need these methods in research and applied science. 2 hr. lect., two 3-hr. lab. (Lab fee $20.00.)

237. *Polymer Chemistry.* I or II. 3 hr. PR or Conc.: Chem. 134, 143 or consent. Methods, mechanisms, and underlying theory of polymerization. Structure and stereochemistry of polymers in relation to chemical, physical, and mechanical properties. 3 hr. lect.

239. *Organic Syntheses.* II. 2 hr. PR: Chem. 136. Modern synthetic methods of organic chemistry. Two 3-hr. lab. (Lab fee $20.00.)

242. *Chemical Bonding and Molecular Structure.* I. 3 hr. PR: Chem. 144, 210. Introduction to the quantum theory of chemical bonding. Atomic structure, theoretical spectroscopy, predictions of molecular structures and bond properties. 3 hr. lect.

243. *Introduction to Radiochemistry and Radiation Chemistry.* I. 3 hr. PR or Conc.: Physical chemistry. Fundamentals of radiochemistry and the use of tracer techniques. An introduction to radiation chemistry and how ionizing radiation interacts with matter. 2 hr. lect., 3 hr. lab. (Lab fee $20.00.)

244. *Colloid and Surface Chemistry.* II. 2 hr. PR: Physical chemistry. Selected topics in the properties and physical chemistry of systems involving macromolecules, lyophobic colloids, and surfaces. 2 hr. lect.

245. *Crystallography.* I. 3 hr. PR or Conc.: Physical chemistry or consent. Applications of X-ray diffraction of crystals to study of crystal and molecular structure. Includes theories of diffraction and crystallographic methods of analysis. 3 hr. lect.

331. *Advanced Organic Chemistry I.* I. 3 hr. PR: Chem. 134. Structural concepts, bonding, tautomerism, static and dynamic stereochemistry, mechanistic classifications of reagents, and reactions including some applications. 3 hr. lect.

332. *Advanced Organic Chemistry II.* II. 3 hr. PR: Chem. 331. Continuation of Chem. 331 with emphasis upon synthetic methods and reaction mechanisms. 3 hr. lect.

341. *Chemical Thermodynamics.* II. 3 hr. PR: Chem. 144. Principles of classical and statistical thermodynamics and their application to chemical problems. 3 hr. lect.

Economics

Faculty

Leo Fishman, Ph.D. (NYU), *Chairperson and Professor.*
Vance Q. Alvis, Ph.D. (U. Va.), *Professor.*
Lee S. Balliet, M.A. (Kent St. U.), *Assistant Professor.*
Lewis C. Bell, Ph.D. (U. Ky.), *Professor.*
Robert D. Britt, Ph.D. (U. Colo.), *Associate Professor.*
Thomas C. Campbell, Jr., Ph.D. (U. Pitt.), *Professor.*
Edward K. Dix, Ph.D. (U. Md.), *Assistant Professor.*
George R. Dreese, Ph.D. (Ohio St. U.), *Associate Professor.*
Randyl D. Elkin, Ph.D. (Iowa St. U.), *Assistant Professor.*
Betty G. Fishman, M.S. (NYU), *Associate Professor.*
Michael S. Fogarty, M.A. (Portland St. U.), *Assistant Professor.*
Richard W. Humphreys, M.A. (U. Wisc.), *Associate Professor.*
Parviz Jenab, M.A. (Ind. U.), *Instructor.*
Dennis R. Leyden, B.S. (Clemson U.), *Assistant Professor.*
Patrick C. Mann, Ph.D. (Ind. U.), *Associate Professor.*
William H. Miernyk, Ph.D. (Harvard U.), *Professor.*
Catherine A. Palomba, Ph.D. (Iowa St. U.), *Assistant Professor.*
Neil A. Palomba, Ph.D. (U. Minn.), *Associate Professor.*
Suzanne E. Reid, Ph.D (Duke U.), *Assistant Professor.*
Kenneth L. Shellhammer, Ph.D. (U. Colo.), *Assistant Professor.*

Wil J. Smith, M.S. (U. Wisc.), *Assistant Professor.*
Owen A. Tapper, M.S. (U. Wisc.), *Assistant Professor.*
James H. Thompson, Ph.D. (U. Pitt.), *Professor.*
Royce J. Watts, M.S. (WVU), *Assistant Professor.*
Tom S. Witt, M.A. (Wash. U.), *Assistant Professor.*
Gregory J. L. Yi, Ph.D. (U. Buffalo), *Assistant Professor.*
Frederick A. Zeller, Ph.D. (Ohio St. U.), *Associate Professor.*

Programs

The College of Business and Economics offers all courses in economics, but these are recognized as a regular part of the program of the College of Arts and Sciences. The College of Business and Economics grants the degree of Bachelor of Science in Economics (B.S.Ec.), while the College of Arts and Sciences grants the A.B. degree with a major in Economics.

The program leading to the A.B. degree is designed for students who wish to combine fundamental training in economics with a liberal arts education. The Core Curriculum requirements must be met in the choice of electives. Of the total 128 hours required for graduation, some 40 or more credit hours are available for elective subjects.

Major in Economics

Required Courses

Econ. 54, 55, 125, 211, 212, 216; Hist. 1 and 2 or Humanities 1 and 2; Hist. 52 and 53 or Pol. Sci. 2 and 120; Math. 3 and 28; Sp.Com. 11 and 12, 13, or 14.

Also three courses from one of the areas of concentration listed below (9 hours—major concentration) and one course from each of two areas other than one chosen for major concentration (6 hours).

Areas of Concentration

1. Quantitative Analysis[1]
   Econ. 220, 200[2], 226
2. Public Sector and Private Enterprise
   Econ. 130, 200[2], 241, 245, 246
3. Human Resources
   Econ. 160, 200[2], 261, 262, 263, 265
4. Regional, International, and Development
   Econ. 200[2], 210, 213, 250, 255, 270

[1]Students wishing to concentrate in quantitative analysis may supplement the area with courses approved by their advisers in mathematics and/or statistics. Students must still take a minimum of 27 upper-division hours in economics.

[2] In order for Econ. 200 (Special Topics) courses to satisfy concentration and distribution requirements, the courses must be selected from the relevant areas of concentration.

Courses of Instruction in Economics

Econ.

Lower Division

51. *The Economic System.* I, II. 3 hr. Introduction to the analysis of the economic system. Pricing system, monetary system, determination of national income and employment.

52. *Contemporary Economic Issues.* I, II. 3 hr. PR: Econ. 51. Current problems relating to the business system, government, and the economy, natural and human resources.

54. *Principles of Economics.* I, II. 3 hr. Elementary microeconomic analysis. Not open, without permission, to students who have taken Econ. 51 and 52.

55. *Principles of Economics.* I, II. 3 hr. PR: Econ. 54. Elementary macroeconomic analysis. Not open, without permission, to students who have taken Econ. 51 and 52.

Upper Division

125. *Statistics.* I, II. 3 hr. PR: Econ. 52 or 54; Math. 3, 8. Basic statistical methods employed in collection, presentation, analysis, and interpretation of business and economic data, such as analysis of frequency distribution, times series, inference, index numbers, and correlation.

130. *Money and Banking.* I, II. 3 hr. PR: Econ. 52 or 54. Our system of monetary and banking arrangements viewed in relation to functioning of the economic system as a whole.

160. *Labor Economics.* I, II. 3 hr. PR: Econ. 52 or 54. Introduction to labor economics and labor policies, personnel practices, and labor law.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Econ. 52, 54 or consent. Study of special topics relevant to economics. Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degrees.

205. *Current Economic Problems.* S. 3 hr. PR: Econ. 52, 54, or consent. For students in education only. A course to acquaint public school teachers with reliable source material in economics in studying current economic problems.

210. *Comparative Economic Systems.* I or II. 3 hr. PR: Econ. 52 or 54. Structure and processes of existing economic systems throughout the world including review of basic principles of free enterprise, socialistic, communistic, and fascistic societies.

211. *Micro Economic Analysis.* I. 3 hr. PR: Econ. 52 or 54. A study of price and output determination and resource allocation in the firm under various competitive conditions.

212. *Macro Economic Analysis.* II. 3 hr. PR: Econ. 52 or 54. Analysis of the forces which determine the level of income, employment, and output. Particular attention to consumer behavior, investment determination, and government fiscal policy.

213. *Economic Development.* I or II. 3 hr. PR: Econ. 52 or 54. Comprehensive study of the problems, changes, and principal policy issues faced by non-industrialized countries in the process of economic development.

216. *History of Economic Thought.* I or II. 3 hr. PR: Econ. 52 or 54. Economic ideas in perspective of historic development.

220. *Introduction to Quantitative Analysis.* I or II. 3 hr. PR: Econ. 125. Study of the principal mathematical techniques employed in economic analysis; an introduction to econometrics.

226. *Advanced Statistics.* II. 3 hr. PR: Econ. 125 or equiv. Advanced approach to statistical analysis with emphasis on probability, inference, and multivaried statistical techniques.

241. *Public Finance.* I, II. 3 hr. PR: Econ. 52 or 54. Governmental fiscal organizations and policy; taxes and tax systems with particular emphasis on the federal government and the state of West Virginia.

245. *Government and Business.* I or II. 3 hr. PR: Econ. 52 or 54. Government in its role of adviser and umpire; analysis of governmental policies and practices affecting business.

246. *Transportation.* I, II. 3 hr. PR: Econ. 52 or 54. Development of an inland transportation system and relations and policies of transport agencies.

250. *International Economics.* I or II. 3 hr. PR: Econ. 52 or 54. Development of trade among nations; theories of trade; policies, physical factors, trends, and barriers in international economics.

255. *Regional Economics.* I or II. 3 hr. PR: Econ. 52 or 54. Analysis of the factors that promote or deter the economic growth of a region, with emphasis on such matters as population shifts, economic base studies, industrial location analyses, input-output techniques, regional income estimation, local multiplier and cycle concepts, and the role of government in regional growth.

261. *Trade Unionism.* I or II. 3 hr. PR: Econ. 160 or consent. Analysis of the structure, government, attitudes, and policies of organized labor; implications of union policy.

262. *Collective Bargaining.* I or II. 3 hr. PR: Econ. 160 or consent. Theory and practice of collective bargaining; including contract issues, types of relationships, and the role of government policy.

263. *Economics of Wages.* I or II. 3 hr. PR: Econ. 160 or consent. Determination of wage levels and structure; including the economics and institutional forces determining wage levels and differentials.

265. *Economics of Social Security.* I or II. 3 hr. PR: Econ. 52, 54, or consent. An examination and analysis of social and political efforts to provide economic security, including an examination of the parallel developments of private insurance.

270. *Growth of the American Economy.* I or II. 3 hr. PR: Econ. 52 or 54. Central issues in the development of the American economy.

299. *Readings in Economics.* I, II, S. 1-3 hr. PR: Econ. 52 or 54. Students will develop and carry out a program of specialized readings under the supervision of a cooperating instructor.

English Language and Literature

Faculty

Ruel E. Foster, Ph.D. (Vanderbilt U.), *Chairperson and Professor.*
Rudolph Almasy, M.A. (U. Minn.), *Instructor.*
Joy U. Berkley, M.A. (WVU), *Assistant Professor.*
Kathleen G. Birss, M.A. (U. Iowa), *Instructor.*
Sophia B. Blaydes, Ph.D. (Ind. U.), *Associate Professor.*
Philip Bordinat, Ph.D. (U. Birmingham, Eng.), *Professor.*
Frances B. Boyd, M.A. (WVU), *Instructor.*
George R. Bramer, Ph.D. (U. Notre Dame), *Associate Professor and Coordinator of Writing Programs.*
J. P. Brawner, Ph.D. (U. Ill.), *Professor Emeritus.*
Arthur C. Buck, M.A. (U. Penn.), *Assistant Professor.*
Mary C. Buswell, M.A. (WVU), *Associate Professor.*
Robert W. Clarke, Ph.D. (U. Wisc.), *Associate Professor.*
Mary Lou Clarkson, M.A. (WVU), *Instructor.*
Ann Crediford, M.A. (WVU), *Instructor (part-time).*
Elizabeth Cypris, M.A. (U. Alberta), *Instructor (part-time).*
Lloyd M. Davis, M.A. (Vanderbilt U.), *Assistant Professor.*

Oreta H. Dawson, M.A. (WVU), *Assistant Professor.*
Edna M. Dillon, M.A. (WVU), *Instructor.*
David W. Dowdell, M.A. (WVU), *Assistant Professor.*
John W. Draper, Ph.D. (Harvard U.), *Professor Emeritus.*
James Dugger, M.A. (U. Iowa), *Instructor.*
Richard B. Eaton, Jr., Ph.D. (U. N.C.), *Associate Professor.*
Nicholas G. Ehle, Jr., M.A. (WVU), *Instructor.*
Nicholas G. Evans, M.A. (WVU), *Instructor.*
William P. Fitzpatrick, Ph.D. (U. Md.), *Assistant Professor.*
Thomas J. Floyd, M.A. (U. Md.), *Instructor.*
John Flynn, M.A. (WVU), *Instructor.*
William W. French, Ph.D. (U. Pitt), *Associate Professor.*
Winston Fuller, M.A. (U. Colo.), *Assistant Professor.*
Jack W. Futrell, M.A. (Columbia U.), *Assistant Professor.*
Patrick W. Gainer, Ph.D. (St. Louis U.), *Professor Emeritus.*
Avery F. Gaskins, Ph.D. (Ind. U.), *Associate Professor.*
Elaine K. Ginsberg, Ph.D. (U. Okla.), *Assistant Professor.*
Thora M. Golz, M.A. (NYU), *Instructor (part-time).*
W. Michael Grant, Ph.D. (Brown U.), *Associate Professor.*
Darrell G. Hagar, Ph.D. (TCU), *Instructor.*
Carolyn H. Hampson, M.A. (WVU), *Instructor.*
Mary K. Haney, M.A. (U. Dayton), *Instructor.*
John L. Hicks, Jr., M.A. (Ind. U.), *Associate Professor.*
Betsy Hobbs, M.S. (WVU), *Instructor.*
Martha C. Howard, M.A. (U. Mich.), *Associate Professor.*
Doris J. Huzzey, M.A. (WVU), *Assistant Professor.*
Betty Jo Hypes, M.A. (WVU), *Instructor.*
Iris M. Jennings, M.A. (WVU), *Instructor.*
John H. Johnston, Ph.D. (U. Wisc.), *Professor.*
Terry Lucas, M.A. (WVU), *Instructor.*
Russell C. MacDonald, Ph.D. (U. Penn.), *Associate Professor.*
Elizabeth Madison, M.A. (Purdue U.), *Instructor.*
Yvonne J. Milspaw, M.A. (Ind. U.), *Instructor.*
Jean Moss, Ph.D. (WVU), *Instructor.*
Byron C. Nelson, M.A. (U. Ill.), *Instructor.*
Virgil L. Peterson, Ph.D. (UCLA), *Associate Professor.*
John Racin, Jr., Ph.D. (Ohio St. U.), *Associate Professor.*
David Ripper, M.A. (Ohio St. U.), *Instructor (part-time)*
Kathleen G. Rousseau, M.A. (WVU), *Instructor.*
Frank Scafella, Jr., Ph.D. (U. Chicago), *Assistant Professor.*
Renata Schmidt, M.A. (U. Mich.), *Instructor.*
Dorothy Sedley, M.A. (Sonoma St. C.), *Instructor.*
Aileen K. Shafer, M.A. (WVU), *Instructor.*
Fred Manning Smith, Ph.D. (Cornell U.), *Professor Emeritus.*
Elizabeth C. Spindler, M.A. (WVU), *Assistant Professor.*
John F. Stasny, M.A. (Marquette U.), *Associate Professor.*
Judith G. Stitzel, Ph.D. (U. Minn.), *Associate Professor.*
Patricia Tweel, M.A. (Ohio St. U.), *Instructor (part-time)*
Hayden Ward, Ph.D. (Columbia U.), *Assistant Professor.*
Anne T. Weisser, M.A. (WVU), *Instructor (part-time).*
Jack Welch, M.F.A. (U. Iowa), *Associate Professor.*

Programs

An English major must complete a minimum of 33 hours in English literature, language, and composition, exclusive of English 1 and 2.

A student may combine studies leading to a Bachelor of Arts degree in English with studies leading to certification for teaching English or Language Arts (comprehensive) in the secondary schools.

Advisers of upper-division students who are not English majors may schedule them for courses in the 100 and 200 series without regard to prerequisites. Students enrolling in 200 courses, however, will have special difficulties if they have not had prior work in literature courses.

Major in English

Required Courses

Introductory

English 21

English 24

One course from the following: English 22 (or 122), 25, 35 (or 135), 36 (or 136)

Language

One course from the following: English 111, 112, 113, 210, 211

American Literature

One course from the following: English 131, 220, 230, 235, 266, 280, 283, 286

British Literature Before 1800

Two courses from the following: English 150, 250, 251, 255, 256, 261, 262, 263, 264

Additional

Four additional courses in English literature, language, or composition

Recommended Electives

The 33 credit hours named above are minimal. The English major may have a maximum of 42 hours in English, exclusive of English 1 and 2, within the 128 hours required for graduation. The student can concentrate on either English or American literature and he can take courses in creative writing.

Recommended electives outside the Department include courses in history, humanities, speech communication, foreign languages, philosophy, and religious studies. A student may establish credit for a limited number of hours in other colleges of the University. Available courses in drama, art, music, and journalism are among those recommended.

Honors Program

At the beginning of the second semester of the junior year, an English major who has achieved an overall grade-point average of 3.0 or better, and whose record in English studies is above 3.0, may apply for admission to the Honors Program of the Department.

Victorian Poetry

The Department of English edits *Victorian Poetry,* the critical journal of Victorian literature established by WVU in 1963, which has become the internationally recognized scholarly journal in its field with subscribers in all 50 states and in 26 foreign countries.

Courses of Instruction in English Language and Literature

English

Lower Division

1. *Composition and Rhetoric.* I, II. 3 hr. Required of all candidates for bachelor's degree in all colleges except for certain students of superior achievement who may be exempted from the requirement under regulations prevailing at time of admission.

2. *Composition and Rhetoric.* I, II. 3 hr. Required of all candidates for bachelor's degree in all colleges unless the requirement for certain students of superior achievement is waived under regulations announced for year of admission.

8. *Intermediate Composition.* I, II. 3 hr. PR: English 1 and 2. Composition for students who wish to develop skills in solving problems of written communication relevant to their career objectives.

21. *Survey: English Literature.* I, II. 3 hr. English authors from Beowulf to Burns and readings from their works. Upperclassmen may substitute English 121 for this course. Students may not receive credit for both English 21 and English 121.

22. *Survey: English Literature.* I, II. 3 hr. English authors from Robert Burns to the present and readings from their works. Upperclassmen may substitute English 122 for this course. Students may not receive credit for both English 22 and English 122.

24. *American Literature.* I, II. 3 hr. American authors to 1870 with readings from their works.

25. *American Literature.* I, II. 3 hr. Continuation of English 24. American poetry and prose from 1870 to the present.

35. *Types of Literature.* I, II. 3 hr. Selected works of English, American, and European poets and dramatists, read for appreciation and enjoyment. Upperclassmen may substitute English 135 for English 35. Students may not receive credit for both English 35 and 135.

36. *Types of Literature.* I, II. 3 hr. Emphasis on examples of prose fiction by English, American, and European writers. Upperclassmen may substitute English 136 for English 36. Students may not receive credit for both English 36 and 136.

80. *Literature of Black America.* I. 3 hr. A survey course in Black American literature from its inception to the present.

Upper Division

101. *Creative Writing: Narration (Short Story).* I, II. 3 hr. Purpose and pattern of the modern short story; study of examples in the current periodicals; special assignments and conferences with individual students on a minimum number of short stories.

102. *Creative Writing: Fiction.* I, II. 3 hr. Workshop course for students to explore further their interests in writing fiction. Emphasis on studying the craft and analyzing the students' own work.

103. *Creative Writing: Poetry.* I, II. 3 hr. Practice in basic techniques of writing poetry. Possibilities and limitations of the poetic genre. Primary emphasis on image, metaphor, and development by association.

104. *Creative Writing: Poetic Structure.* I, II. 3 hr. Theories of poetic structure. Practice in technique with primary emphasis on writing the line. Secondary attention to rhythm and sound.

108. *Advanced Composition.* I, II. 3 hr. PR: English 1 and 2. Composition for advanced students who wish to further develop their expository writing skills.

111. *The English Language.* I, II. 3 hr. Structure of the English language. Linguistic study designed especially for English teachers in secondary schools. Required of all teacher trainees preparing for certification in English or Language Arts.

112. *Words and Usage.* II. 3 hr. Practical vocabulary building, English grammar and usage. Attention to the derivation, history, and meaning of words, and to the principles of syntax and grammar.

113. *American English.* II. 3 hr. Historical survey of the development of American English from the time of colonization to the present. Attention to social, cultural, economic, and political forces that have influenced the development of American English. Emphasis on the Appalachian dialect.

121. *English Literature.* I, II. 3 hr. Survey of English literature from the beginning to 1800. May be substituted for English 21 but may not be elected by students who already have credit for English 21.

122. *English Literature.* I, II. 3 hr. Continuation of English 121 from 1800 to present. May be substituted for English 22 but may not be elected by students who already have credit for English 22.

125. *World Literature.* I, II. 3 hr. Selected readings in the works of authors of world literature both ancient and modern.

131. *American Fiction.* I, II. 3 hr. Reading of ten or more American novels of nineteenth and twentieth centuries each considered as a work of art reflecting a significant view of life. Lectures on principal authors, with class discussion of particular books.

132. *Poetry.* I, II. 3 hr. Appreciation and enjoyment of poems through critical and analytical reading. Studies in the various types of poetry, and of the language, imagery, and techniques of poetic expression.

133. *The Short Story.* II. 3 hr. Study of the short story's structure, history, and contemporary forms.

135. *Introduction to Literature (Part I).* I, II. 3 hr. Poetry and drama, read for understanding and enjoyment. Core Curriculum course comparable to English 35, for upper-division students. May not be taken in addition to English 35.

136. *Introduction to Literature (Part II).* I, II. 3 hr. Core Curriculum course comparable to English 36. Prose fiction: stories and novels. For upper-division students. May not be taken in addition to English 36.

140. *Introduction to Folklore.* I, II, S. 3 hr. General view of folklore, in both its theoretical and its functional aspects. Emphasis on recognition, collection, and documentation of collected materials.

141. *American Folklore and Culture.* I, II, S. 3 hr. PR: English 140 or consent. Various aspects of folklore from the American Indian, early settlers, the American Negro, the immigrant, and occupational groups. Influence of folklore on American culture.

150. *Shakespeare.* I, II. 3 hr. Twelve of Shakespeare's most important plays.

161. *Elizabethan Poetry and Prose.* I. 3 hr. Renaissance in England as manifested in the great variety of nondramatic literature works of the sixteenth century, with emphasis on the major writers of the reign of Elizabeth I.

170. *Contemporary Literature.* I. 3 hr. Modern British and American poets and prose writers—including novelists, short-story writers, dramatists, and essayists. Chronology is roughly from 1900 to 1925.

171. *Contemporary Literature.* II. 3 hr. Continuation of English 170 from approximately 1925 to the present time.

180. *Bible Literature: Old Testament.* I. 3 hr. Various types of literature exemplified in the Old Testament, read for their intrinsic merit and for their historical and cultural significance. Continued in English 181.

181. *Bible Literature: New Testament and Apocrypha.* II. 3 hr. Contents of the Old Testament Apocrypha and New Testament, their literary quality, with consideration of historical relations and of relationships of the several writers represented.

185. *An Introduction to Contemporary African Literature.* II. 3 hr. Survey course including contemporary African poetry, drama, and fiction.

188. *Images of Women in Literature.* I, II. 3 hr. Representative literary works studied against backdrop of social and historical documents to examine effect of images of women in literature on self-image of women today. Open to all students.

190. *Independent Study.* I, II. 1-3 hr. PR: Consent. With departmental consent, may be repeated for a maximum of 9 credit hours.

191. *Special Topics.* I, II. 3 hr. PR: Consent. With departmental consent, may be repeated for a maximum of nine credit hours. (Credit received for repeating English 191 only when content of course is different.) Topics in literature, language, or writing.

197. *Honors Course.* I, II. 3 hr. Independent reading and study. For students admitted to the Honors Program in the second semester of their junior year.

198. *Honors Course.* I, II. 3 hr. For the first semester of the senior year of students admitted to the Honors Program.

201. *Creative Writing.* II. 3 hr. PR: English 101, 102, or 103, or their equiv., or consent. Advanced workshop in creative writing for students who are seriously engaged in the writing of a major work.

210. *Structure of the English Language.* I, II. 3 hr. Historical, comparative, and descriptive grammar, together with an introduction to English linguistics.

211. *History of the English Language.* I. 3 hr. Study of the nature of the language; questions of origins, language families, development, relationships of English as one of the Indo-European languages.

220. *American Poetry.* I. 3 hr. Study of major American poets of the nineteenth and twentieth centuries — Bryant, Poe, Emerson, Longfellow, Whitman, Dickinson, Frost, and Eliot. Primary emphasis on their poetry as poetry; background materials minimized.

230. *Modern American Biography.* I. 3 hr. Selection of most significant and interesting biographies and autobiographies of Americans of distinction in literature, arts, and public life.

231. *Modern British Biography.* II. 3 hr. Representative biographies and autobiographies of important British figures in public life and arts, chosen for their literary value and their interest and relevance in contemporary life.

232. *Literary Criticism.* II. 3 hr. History of literary criticism from Aristotle to modern times.

233. *Recent Literary Criticism.* I, II. 3 hr. Brief survey of theories and essays of five major schools of modern criticism and an application of these theories to a novel, a play, and to selected poems and short stories.

234. *Modern Drama.* II. 3 hr. World drama from Ibsen to the present day.

235. *American Drama.* II. 3 hr. Representative American dramas and history of theatre in America.

236. *Tragedy.* II. 3 hr. Masterpieces of tragedy from Greek times to modern, with consideration of changing concepts of tragedy and of ethical and ideological values reflected in works of major tragic authors.

240. *Folk Literature.* I. 3 hr. The folk ballad, its origin, history, and literary significance, based on Child's collection and on American ballad collections.

241. *Folk Literature of the Southern Appalachian Region.* II. 3 hr. Traditional literature of southern Appalachian region, including songs, prose, tales, languages, customs, based on material collected in the region — especially in West Virginia.

250. *Shakespearean Comedies and History Plays.* I. 3 hr. Representative comedies of Shakespeare against the background of classical and Renaissance theory and practice, and of selected history plays.

251. *Shakespearean Tragedy.* II. 3 hr. Principal tragedies of Shakespeare, together with the history of criticism, scholarly investigation, and interpretation.

255. *Chaucer.* I. 3 hr. Early poems, *Troilus and Criseyde,* and *The Canterbury Tales.* In addition to an understanding and appreciation of Chaucer's works, the student is expected to acquire an adequate knowledge of Chaucer's language.

256. *Milton.* II. 3 hr. All of Milton's poems and a few selected prose works.

261. *Sixteenth Century Prose and Poetry.* I. 3 hr. Studies from Caxton to Bacon, from Skelton to Shakespeare.

262. *Seventeenth Century Prose and Poetry.* II. 3 hr. Studies from Donne to Dryden.

263. *Literature of the Eighteenth Century.* I. 3 hr. Literature of the period 1660-1744 in relation to social, political, and religious movements of the time.

264. *Literature of the Eighteenth Century.* II. 3 hr. Continuation of English 263, covering the latter half of the century. May be taken independently of English 263.

265. *The Romantic Movement.* I. 3 hr. Works of Wordsworth, Coleridge, and Keats, together with an introduction to works of scholarship in English Romanticism.

266. *American Romanticism.* II. 3 hr. Writings of Ralph Waldo Emerson, Henry David Thoreau, and Nathaniel Hawthorne. A study of relations of these men to history of their own time. Their contributions to American thought and art.

267. *Victorian Poetry.* I. 3 hr. The major Victorian poets — Tennyson, Browning, Arnold, Rossetti, Morris, Swinburne, Fitzgerald — and a few of the later Victorian poets.

268. *Modern British Poetry.* I. 3 hr. British poetry from 1880 to present, including the Decadents, Counter-Decadents, Hopkins, Housman, Hardy, the Georgians, the Imagists, World War I poets, Yeats, Eliot, the Auden Group, and post-World War II poets.

280. *Southern Writers.* II. 3 hr. Examination of twentieth-century Southern essayists, poets, short-story writers, and novelists in relation to ideological background.

281. *Literature for Teachers.* S. 3 hr. Study and appreciation of selected works of American authors, with special reference to the high school curriculum.

282. *Literature for Teachers.* S. 3 hr. Study and appreciation of selected works of English authors. Recommended for teachers of high school curriculum.

283. *Study of Selected Authors (American).* I, II. 3 hr. Study of the works of a principal American author, or more than one.

284. *Study of Selected Authors (English).* I, II. 3 hr. Study of the works of one or more of the principal English authors.

286. *Black American Fiction.* II. 3 hr. Survey of novels and short stories written by black Americans from 1890 to the present.

288. *Women Writers in England and America.* II. 3 hr. PR: Previous courses in English or consent. Syllabus may vary from year to year to include women writers in a particular country, historical period, or genre; or writing on a particular theme.

290. *Independent Study.* I, II. 1-3 hr. PR: Consent. With departmental consent, may be repeated for a maximum of 9 credit hours. Individual study of literary, linguistic, and writing problems.

291. *Special Topics.* I, II. 3 hr. PR: Consent. With departmental consent, may be repeated for a maximum of nine credit hours. (Credit received for repeating English 291 only when content of course is different.) Topics in literature, language, or writing.

310. *Old English.* (I). I. 3 hr. Study of Anglo-Saxon with selected readings from the literature of the period.

311. *Old English.* (II). II. 3 hr. PR: English 310. *Beowulf* and other texts in Old English.

312. *Approaches to Teaching Composition.* S. 3 hr. PR: English 1, 2. Survey of techniques of teaching writing in elementary and secondary schools. Opportunities for students to write, to analyze their writing, and to experiment in class with various methods of teaching writing.

330. *Early English Drama.* I. 3 hr. Study of the medieval and early Tudor drama to the age of Shakespeare.

331. *Elizabethan Drama.* II. 3 hr. Study of dramas of Shakespeare's contemporaries and successors to the closing of the theatres in 1642. Includes Kyd, Marlowe, Jonson, Heywood, Chapman, Webster, Beaumont, and Fletcher.

332. *Restoration and Eighteenth Century Drama.* II. 3 hr. Comedy, tragedy, the heroic play, the drama of sensibility and the reaction against it: Etherege, Wycherley, Farquhar, Congreve, Vanbrugh, Dryden, Otway, Goldsmith, and Sheridan.

334. *Contemporary Drama.* II. 3 hr. Recent developments in the drama, with special attention to Miller, Williams, Sartre, Anouilh, Osborne, Pinter, Bolt, and the Absurdists. Content altered as new playwrights representing new developments come into prominence.

335. *The English Novel to the Time of Scott.* I. 3 hr. Study of the English novel from the sixteenth century to the time of Scott, showing the development of the novelistic art from early narrative beginnings.

336. *The English Novel, 1832-1900.* II. 3 hr. Continuation of English 335. Development of the English novel from the early nineteenth century to the beginning of the twentieth century.

337. *The Modern Novel.* I. 3 hr. Twentieth-century novel, with emphasis on works of selected British novelists.

340. *The American Novel to 1915, I.* I. 3 hr. History of American novel, based on reading of ten or twelve novels, from the beginning to World War I.

341. *The American Novel, II.* II. 3 hr. History of the American novel, based on readings of ten to twelve novels from World War I to the present.

350. *Shakespeare.* I. 3 hr. Intensive study of selected plays. Special attention to textual problems and to language and poetic imagery, together with the history of Shakespearean criticism and scholarship.

355. *Spenser.* I. 3 hr. A study of Spenser's poetry, minor poems, and *The Faerie Queene*, forms and sources, purpose of the great epic, social, political, and religious allegory.

356. *Byron and Shelley.* II. 3 hr. Reading and study of the works of two poets of the later Romantic Movement, together with works of criticism and scholarship related to the period.

365. *Victorian Prose.* II. 3 hr. Study of the non-fictional writings of the great Victorian prose critics: Carlyle, Ruskin, Arnold, Newman, Macaulay, Huxley, and Morris.

366. *English Literature, 1880-1918.* II. 3 hr. Study of the more important writers and literary movements of the late Victorian and the Edwardian periods; emphasis on Hardy, Housman, Hopkins, Henley, Pater, Gissing, Moore, Butler, and writers of the "Aesthetic Movement."

369. *American Literature to 1830.* I. 3 hr. Study of American literature and its informing cultural milieu and early national periods, 1607-1830.

370. *American Literature, 1830-65.* II. 3 hr. Study of the literature of the Romantic period in American literature, concentrating on Emerson, Thoreau, Poe, Hawthorne, and Melville.

371. *American Literature, 1865-1915.* I. 3 hr. Study of the literature of transcendentalism, realism, and naturalism in America between the Civil War and World War I, concentrating on Whitman, Twain, James, Dickinson, Crane, Adams, and Dreiser.

372. *American Literature, 1915-Present.* II. 3 hr. A study of American prose, poetry, and drama since 1915.

Foreign Languages

Faculty

Robert J. Elkins, Ph.D. (U. Kans.), *Professor of German; Chairperson Foreign Languages.*
Michel J. Beauchemin, M.A. (Brown U.), *Assistant Professor of Romance Languages.*
Renate Benkert, Ph.D. (U. S. Cal.), *Assistant Professor of German.*
Laszlo Borsay, Ph.D. (U. Pitt.), *Associate Professor of Classical Languages.*
Rafael R. del Valle, Ph.D. (Natl. U. Mex.), *Associate Professor of Latin American Studies (retired).*
Emile G. Frère, Ph.D. (U. Pitt.), *Professor of French.*
Eleanor R. Gibbard, M.A. (WVU), *Assistant Professor of French; Foreign Languages Examiner.*
Pablo Gonzalez, M.A. (U. Pitt.), *Assistant Professor of Spanish.*
Gary L. Harris, Ph.D. (Ohio St. U.), *Assistant Professor of Russian.*
Francisco Herrera, M.A. (WVU), *Professor of Spanish.*
Donald T. Huffman, M.A. (Ind. U.), *Assistant Professor of German.*
Victor J. Lemke, Ph.D. (U. Wisc.), *Professor of German.*
Arthur C. McBride, Docteur de l'universite de Bordeaux (U. Bordeaux), *Professor Emeritus of French.*
Warren F. Manning, Ph.D. (Harvard U.), *Professor Emeritus of Romance Languages.*
Joseph A. Murphy, Ph.D. (Ohio St. U.), *Associate Professor of French.*
Jean-Pierre M. Ponchie, Ph.D. (Mich. St. U.), *Associate Professor of French.*
Joseph J. Prentiss, Ph.D. (U. Pitt.) *Associate Professor of Classical Languages.*
Joseph F. Renahan, M.S. (Yeshiva U.), *Assistant Professor of Romance Languages.*
William L. Siemens, (U. Kans.), *Assistant Professor of Spanish.*
Armand E. Singer, Ph.D. (Duke U.), *Professor of Romance Languages.*
Claude C. Spiker, Ph.D. (U. Chicago), *Professor Emeritus of Romance Languages.*
Robert Stilwell, Ph.D. (U. Tex.), *Professor Emeritus of German.*
Harley U. Taylor, Ph.D. (Ind. U.), *Associate Professor of German; Associate Chairperson.*
David Torres, Ph.D. (U. Ill.), *Assistant Professor of Spanish.*

Rebecca E. Wade, M.A. (Middlebury C.), *Assistant Professor of French (retired).*

Programs

The Department of Foreign Languages offers work in foreign languages, literatures, cultures, and in linguistics. Languages included are French, German, Greek, Italian, Latin, Russian, Spanish, and Swahili. Other areas are Linguistics, Language Teaching Methods, and Bibliography and Research. A student may be a candidate for an A.B. degree, with a major or minor in French, German, Latin, Russian, or Spanish, or with a minor in Greek.

Students must have a 2.5 in lower-division courses in the language they elect as a major or minor. Thirty-six hours of work in a given language constitute a major and 12 hours of upper-division work in a second subject is required as a minor. If a student should enroll in fewer than six hours of lower-division courses in the major, thirty hours of upper-division work will constitute a major. The department recommends that students who major in a foreign language, minor in a second language, although other fields may be selected upon approval of the department. During the second semester of the senior year each major will be required to take a comprehensive examination testing the student's control of the major language. Students who wish to earn professional certificates as elementary or secondary foreign language teachers are required to take Language Teaching Methods 221. The Department of Foreign Languages cooperates with several other departments in offering an interdepartmental major in both Slavic Studies and Linguistics.

Note 1: The basic series of foreign language courses is divided into three levels: elementary, intermediate, and advanced. The elementary level, 1 and 2, provides beginning work in the four basic skills of the language: understanding, speaking, reading, and writing, with emphasis on audio-lingual procedures. The vocabulary employed is limited to words of high frequency. Intermediate level, 3 and 4, provides further training in the four basic skills, with greater emphasis on reading. The vocabulary is greatly extended, especially with the passive or recognition vocabulary. The advanced level, 103, 104, 109, and 110, is intended primarily for foreign language majors and for those additional students who wish to master a foreign language. The four basic skills are further developed. All classroom questions and discussions are in the foreign language. The work is based on reading assignments followed by classroom discussions, oral drills, and written exercises.

Note 2: In French, German, and Spanish alternative routes are offered at the elementary and intermediate levels, Courses number 21, 22, 23, and 24 provide four semester of work intended to develop a thorough reading knowledge. In them very little attention is given to pronunciation and none at all to other aspects of the oral skills. Students read at their own pace and are given some choice as to the type of material they read in the third and fourth semesters.

Courses numbered 31, 32, 33, and 34 provide four semesters with instruction divided between the culture of the country or area where the foreign language is the normal means of communication and the language itself. Although language study continues, it is at a slower pace than in the regular sections. Students may change tracks only after course 2, 22, or 32 except in unusual circumstances and only with the permission of the department chairperson.

Major in French

Required Courses

French 1 and 2 or equiv., 3, 4, 103, 104, 109, 110, 115, 116, 118, 231, Ling. 111.

Major in German

Required Courses

German 1 and 2 or equiv., 3, 4, 103, 104, 109, 110, Ling. 111.

Recommended Electives

German 136, 242, 246, 247, 265, Ling. 251.

Major in Latin

Required Courses

Latin 1 and 2 or equiv., 3, 4, 110, 121, 122, Ling. 111.

Recommended Electives

Latin 109, 131, 201, 202, 231, 234, 235, 237, Ling. 225, Ling. 227.

Major in Russian

Required Courses

Russian 1 and 2 or equiv., 3, 4, 103, 104, 109, 110, 144, 145, Ling. 111.

Recommended Electives

Russian 105, 106, 211, 212, Ling. 231, Ling. 232.

Major in Spanish

Required Courses

Spanish 1 and 2 or equiv., 3, 4, 103, 104, 109, 110, Ling. 111.

Recommended Electives

Spanish 111, 112, 116, 117, 118, 221, 222, Ling. 255.

Courses of Instruction in Bibliography and Research

Biblio. & Res.

Upper Division

365. *Methods of Research.* I. 3 hr.

Courses of Instruction in French

Lower Division

1. *Elementary French.* I, II. 3 hr.
2. *Elementary French.* I, II. 3 hr. Continuation of French 1.
3. *Intermediate French.* I, II. 3 hr. PR: French 1, 2, or equiv.
4. *Intermediate French.* I, II. 3 hr. PR: French 3, or consent. Continuation of French 3.
21. *Elementary French: Programmed Reading.* I. 3 hr. Beginning French with concentration on reading comprehension.
22. *Elementary French: Programmed Reading.* II. 3 hr. PR: French 21 or equiv. Continuation of French 21.
23. *Intermediate French: Programmed Reading.* I. 3 hr. PR: French 21, 22, or equiv.
24. *Intermediate French: Programmed Reading.* II. 3 hr. PR: French 21, 22, 23, or equiv. Continuation of French 23.
31. *Elementary French: Cultural Emphasis.* I. 3 hr. Beginning French with equal emphasis on the contemporary culture of France.
32. *Elementary French: Cultural Emphasis.* II. 3 hr. PR: French 31 or equiv. Continuation of French 31.
33. *Intermediate French: Cultural Emphasis.* I. 3 hr. PR: French 31, 32, or equiv.

34. *Intermediate French: Cultural Emphasis.* II. 3 hr. PR: French 31, 32, 33, or equiv. Continuation of French 33.

Upper Division

103. *Advanced French.* I. 3 hr. PR: French 3, 4, consent.

104. *Advanced French.* II. 3 hr. PR: French 103 or consent.

109. *Advanced French.* I. 3 hr. PR: French 104 or consent.

110. *Advanced French.* II. 3 hr. PR: French 109 or consent.

115. *The Classical School.* I. 3 hr. PR: 12 hr. of French or equiv.

116. *Literature of the Eighteenth Century.* II. 3 hr. PR: 12 hr. of French or equiv.

118. *Literature of the Nineteenth Century.* I. 3 hr. PR: 12 hr. of French or equiv.

203. *Refresher Course in Conversational French.* I. 3 hr. PR: Consent. Intensive spoken French designed primarily for teachers of French in the elementary school.

217. *French Civilization.* II. 3 hr. PR: 12 hr. of French.

221. *The Romantic Movement.* I. 3 hr. PR: A.B. in French or consent.

222. *French Realism.* II. 3 hr. PR: A.B. in French or consent.

229. *Literature of the Sixteenth Century.* I. 3 hr. PR: A.B. in French or consent.

231. *Phonetics and Pronunciation.* II. 3 hr. PR: 18 hr. of French or equiv.

292. *Pro-Seminar.* 1-6 hr.* Special topics.

305. *Fundamentals for Reading French.* I. 3 hr. PR: Graduate status.

306. *Reading French.* II. 3 hr. PR: Graduate status and French 305 or equiv. proficiency.

326. *Literary Criticism.* II. 3 hr. PR: A.B. in French or consent.

327. *Graduate Reading in French.* No credit. A special course to help students prepare for the Ph.D. reading examination in French.

337. *Moliere.* II. 3 hr. PR: A.B. in French or consent.

344. *Explication de Textes.* II. 3 hr. PR: 18 hr. of French or equiv.

371. *The Modern Novel to 1930.* I. 3 yr. PR: A.B. in French or consent.

372. *The Novel After 1930.* II. 3 hr. PR: A.B. in French or consent.

381. *Medieval French Literature.* II. 3 hr. PR: Linguistics 390 (Old French).

392. *Seminar.* 1-6 hr. Special topics.

Courses of Instruction in German

German

Lower Division

1. *Elementary German.* I, II. 3 hr.

2. *Elementary German.* I, II. 3 hr.

3. *Intermediate German.* I, II. 3 hr. PR: German 1 and 2, or equiv.

4. *Intermediate German.* I, II. 3 hr. PR: German 3, or consent. Continuation of German 3.

21. *Elementary German: Programmed Reading.* I. 3 hr. Beginning German with concentration on reading comprehension.

*Variable credit courses normally carry 3 hr. credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

22. *Elementary German: Programmed Reading.* II. 3 hr. PR: German 21 or equiv. Continuation of German 21.

23. *Intermediate German: Programmed Reading.* I. 3 hr. PR: German 21, 22, or equiv.

24. *Intermediate German: Programmed Reading.* II. 3 hr. PR: German 21, 22, 23, or equiv. Continuation of German 23.

31. *Elementary German: Cultural Emphasis.* I. 3 hr. Beginning German with equal emphasis on the contemporary culture of Germany.

32. *Elementary German: Cultural Emphasis.* II. 3 hr. PR: German 31 or equiv. Continuation of German 31.

33. *Intermediate German: Cultural Emphasis.* I. 3 hr. PR: German 31, 32, or equiv.

34. *Intermediate German: Cultural Emphasis.* II. 3 hr. PR: German 31, 32, 33, or equiv. Continuation of German 33.

Upper Division

103. *Advanced German.* I. 3 hr. PR: German 3, 4, or consent.

104. *Advanced German.* II. 3 hr. PR: German 103 or consent.

105. *The German Novelle.* I. 3 hr. PR: German 3, 4, or consent. Representative stories of Keller, Meyer, Storm, and Stifter.

106. *The German Novelle.* II. 3 hr. PR: German 3, 4, or consent. From Naturalism to present day. Continuation of German 105.

107. *Nineteenth Century Drama.* I. 3 hr. PR: German 3, 4, or consent. Critical study of selected dramas by Kleist, Grillparzer, Hebbel, and Ludwig.

108. *Nineteenth Century Drama.* II. 3 hr. PR: German 3, 4, or consent. Continuation of German 107.

109. *Advanced German.* I. 3 hr. PR: German 104 or consent. Continuation of the four basic skills.

110. *Advanced German.* II. 3 hr. PR: German 109 or consent.

121. *Scientific German.* I. 3 hr. PR: German 1, 2. Primarily for students in science courses.

122. *Scientific German.* II. 3 hr. Continuation of German 121.

136. *Introduction to Goethe.* II. 3 hr. PR: German 3, 4, or consent.

163. *Modern German Prose in English Translation.* I. 3 hr. Reading and discussion of outstanding German short stories and a few novels. (No credit allowed for departmental major or for regular language requirements.)

242. *Faust.* II. 3 hr. PR: German 4, or consent. Critical study of Goethe's *Faust.*

243. *Medieval German Literature.* I. 3 hr. PR: German 4 or consent.

244. *German Literature of the Reformation and Renaissance.* II. 3 hr. PR: German 4 or consent.

245. *Classicism and Romanticism.* I. 3 hr. PR: German 4 or consent. A critical study of German literature from 1750 to 1830.

246. *The Liberal Age.* II. 3 hr. PR: German 4 or consent. A critical study of German literature from 1830 to 1880, with emphasis upon poetic realism.

247. *The Age of Crisis.* I. 3 hr. PR: German 4 or consent. Critical study of German literature from 1880 to the present.

265. *German Civilization.* I. 3 hr. PR: 12 hr. of German or consent. A general comprehensive survey of the most important aspects of German culture, including a brief historical background, the development of the German language, geography, science, music, art, architecture, literature, and philosophy.

292. *Pro-Seminar.* 1-6 hr.* Special topics.

301. *Independent Reading.* I. 3 hr. Supervised reading for students who want to do intensive work in any field of interest.

302. *Independent Reading.* II. 3 hr. Continuation of German 301.

327. *Graduate Reading in German.* No credit. Special course to help students prepare for the Ph.D. reading examination in German.

361. *Lyric Poetry.* I. 3 hr. PR: German 3, 4, or consent.

375. *The Modern Novel.* I. 3 hr. PR: 18 hr. of German. Supervised reading of nineteenth century novels.

376. *The Modern Novel.* II. 3 hr. Continuation of German 275, with emphasis on recent fiction.

392. *Seminar.* 1-6 hr.* Special topics.

Courses of Instruction in Greek

Greek

Lower Division

1. *Elementary Greek.* I. 3 hr.
2. *Elementary Greek.* II. 3 hr. Continuation of Greek 1.
3. *Intermediate Greek.* I. 3 hr.
4. *Intermediate Greek.* II. 3 hr. Continuation of Greek 3.

Upper Division

109. *Selections from Medieval and Modern Greek Literature.* I. 3 hr.

110. *Selections from the Attic Orators.* II. 3 hr.

111. *New Testament Greek.* I. 3 hr. PR: Consent. Selections from the *Septuagint*, the Greek *New Testament*, and the early Church Fathers.

121. *Survey of Greek Literature.* I. 3 hr. PR: Greek 109, 110, or consent.

122. *Survey of Greek Literature.* II. 3 hr. Continuation of Greek 121.

292. *Pro-Seminar.* 1-6 hr.* Special topics.

392. *Seminar.* 1-6 hr.* Special topics.

Courses of Instruction in Italian

Italian

Lower Division

1. *Elementary Italian.* I. 3 hr.
2. *Elementary Italian.* II. 3 hr. Continuation of Italian 1.
3. *Intermediate Italian.* I. 3 hr. PR: Italian 1, 2, or equiv.
4. *Intermediate Italian.* II. 3 hr. PR: Italian 3 or consent. Continuation of Italian 3.

*Variable credit courses normally carry 3 hr. credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

Courses of Instruction in Language Teaching Methods

LTM

Upper Division

221. *The Teaching of Foreign Languages.* I. 3 hr. Required of all students who are prospective foreign language teachers on the secondary level.

222. *Language Laboratory Techniques.* II. 3 hr.

270. *Problems in the Teaching of French in the Elementary School.* I. 3 hr. PR: Consent.

Courses of Instruction in Latin

Latin

Lower Division

1. *Elementary Latin.* I. 3 hr.

2. *Elementary Latin.* II. 3 hr. Continuation of Latin 1.

3. *Intermediate Latin.* I. 3 hr. PR: Latin 1, 2, or two years of high-school Latin. Selections from Caesar, Aulus, Gellius, and Nepos, and from other authors of comparable difficulty; designed to prepare students to read orations of Cicero.

4. *Intermediate Latin.* II. 3 hr. PR: Latin 3. Continuation of Latin 3.

Upper Division

109. *Selections from Roman Prose.* I. 3 hr. PR: Latin 3, 4, or equiv.

110. *Selections from Roman Poetry.* II. 3 hr. PR: Latin 4, 109, or equiv.

113. *Roman Biographers.* I. 3 hr. PR: Latin 3, 4, or consent. Selections from the *Famous Men* of Cornelius Nepos, and from the Silver Age biographers.

114. *Roman Elegy.* II. 3 hr. PR: Latin 3 or 4 or consent. Selections from Ovid.

121. *Survey of Latin Literature.* I. 3 hr. PR: Latin 109 and 110 or consent.

122. *Survey of Latin Literature.* II. 3 hr. PR: Latin 109 or 110 or consent.

131. *Latin Prose Composition.* II. 3 hr. PR: Latin 3 or 4 or consent. Advanced grammar and composition.

192. *Special Topics.* I, II. 3 hr. PR: Latin 4 or consent. Selected writings and special problems in Latin literature.

201. *Roman Novelists.* I. 3 hr. PR: Latin 109, 110, or equiv. The origin of the novel is traced from Homer to the Medieval Greek and Latin romance writers. Readings include selections from Petronius the *Cena Trimalchionis,* and from Apuleius, *Cupid and Psyche.*

202. *Roman Comedy.* II. 3 hr. PR: Latin 109, 110, or equiv. Brief history of the origin and development of Greek and Roman comedy. Readings include the *Menaechmi* of Platus, and the *Andria* of Terence.

231. *Roman Satire.* I. 3 hr. PR: Latin 109, 110, or equiv. Greek satirical writings and the origin of the Roman satire. Readings include selections from the *Satires* of Horace, and from the *Satires* of Persius and Juvenal.

234. *Roman Historians.* I. 3 hr. PR: Latin 109, 110, or equiv. Origin and development of Roman historiography and its Greek antecedents. Readings include selections from Livy's *History,* from Tacitus' *Agricola,* and from Suetonius' *Augustus.*

235. *Roman Epic.* I. 3 hr. Latin 109, 110, or equiv. Origin and development of the Greek and Roman epic. Readings include selections from Vergil's *Aeneid,* from Lucretius' *De Rerum Natura,* and from the earlier and later epic poets.

236. *Roman Philosophers.* II. 3 hr. PR: Latin 109, 110, or equiv. Origin and development of Greek philosophy and its influence upon Roman philosophy. Readings include selections from Cicero's *Tusculan Disputations* on the immortality of the soul and from Seneca's *Epistles.*

237. *Roman Lyric Poetry.* I. 3 hr. PR: Latin 109, 110, or equiv. Origin and development of the Greek and Roman lyric poetry. Readings include selections from Horace, Catullus, Tibullus, and Propertius.

292. *Pro-Seminar.* 1-6 hr.* Special topics.

392. *Seminar.* 1-6 hr.* Special topics.

Courses of Instruction in Linguistics

Linguistics

Lower Division

1. *Introduction to Language.* I, II, S. 3 hr. General introduction to the different languages of the world. Oral and written communication.

Upper Division

111. *Introduction to Structural Linguistics.* I. 3 hr. Required for foreign language majors.

201. *Linguistics As Applied to Spanish-American Dialects.* I. 3 hr. PR: A.B. in Spanish or consent. To acquaint students with the principles of structural linguistics and those points of structure and vocabulary in which American Spanish differs from standard Castilian.

225. *Comparative Grammar of Greek and Latin.* I. 3 hr. PR: Consent.

226. *Italic Dialects.* II. 3 hr. PR: Consent.

227. *Vulgar Latin.* II. 3 hr. PR: Latin, 109, 110, or equiv. Selections from Latin inscriptions and later Latin literature are studied to illustrate the development of Latin from its earliest times to its passing into the Romance languages.

231. *The Structure of Modern Russian.* I. 3 hr. PR: 12 hr. of Russian or consent. Advanced study of Russian phonetics and phonemics.

232. *The Structure of Modern Russian.* II. 3 hr. PR: Linguistics 231 or consent. Advanced study of Russian morphology and syntax.

251. *History of the German Language.* I. 3 hr. PR: 18 hr. of German or consent. Historical development of standard German with emphasis on its relationships to the other German languages and dialects.

255. *History of the Spanish Language.* I. 3 hr. PR: A.B. in Spanish or consent. A study of the development of the Spanish language and of the transformation of the Castilian dialect into the national language of Spain.

292. *Pro-Seminar.* 1-6 hr.* Special topics.

311. *Middle High German.* I. 3 hr. PR: 12 hr. of German from upper division. Study of the linguistic developments of Middle High German from the eleventh to the fifteenth centuries with illustrative readings from the *Nibelungelied.*

312. *Middle High German.* II. 3 hr. Continuation of Linguistics 311 with illustrative readings from the Middle High German lyric poets and the courtly epics.

352. *Comparative Germanic Linguistics.* II. 3 hr. PR: Linguistics 251 or consent. A comparative study of Gothic, Old English, Old Norse, Old High German, and Old Saxon.

*Variable credit courses normally carry 3 hr. credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

371. *Old English.* I. 3 hr. PR: Consent. Elementary study of Old West Saxon with illustrative materials from prose and poetry.

372. *Old English.* II. 3 hr. Continuation of Linguistics 371. Comparison of the Old English dialects, with extensive illustrative reading, especially in *Beowulf.*

381. *Old Norse.* I. 3 hr. PR: Consent. Elementary study of Old West Norse prose.

382. *Old Norse.* II. 3 hr. Continuation of Linguistics 381. Readings in various Old Icelandic sagas; introduction to Old Norse poetry.

390. *Old French.* II. 3 hr. PR: Consent.

392. *Seminar.* 1-6 hr.* Special topics.

396. *Old Spanish.* II. 3 hr. PR: Consent.

Courses of Instruction in Russian

Russian

Lower Division

1. *Elementary Russian.* I. 3 hr.

2. *Elementary Russian.* II. 3 hr. Continuation of Russian 1.

3. *Intermediate Russian.* I. 3 hr. PR: Russian 1, 2, or equiv.

4. *Intermediate Russian.* II. 3 hr. PR: Russian 3 or consent. Continuation of Russian 3.

21. *Elementary Programmed Russian I.* I, II. 3 hr. Introduction to the Russian language. Emphasis on developing reading and translating ability. Student proceeds at his own pace.

22. *Elementary Programmed Russian II.* I, II. 3 hr. PR: Russian 21 or Russian 1 with consent. Continuation of Russian 21. Emphasis on developing reading and translating ability. Student proceeds at own pace.

Upper Division

103. *Advanced Russian.* I. 3 hr. PR: Russian 3, 4, or consent.

104. *Advanced Russian.* II. 3 hr. PR: Russian 103 or consent.

105. *The Russian Short Story.* I. 3 hr. PR: 12 hr. of Russian or equiv.

106. *The Russian Short Story.* II. 3 hr. PR: 12 hr. of Russian or equiv. Continuation of Russian 105.

109. *Advanced Russian.* I. 3 hr. PR: Russian 104 or consent.

110. *Advanced Russian.* II. 3 hr. PR: Russian 109 or consent.

121. *Scientific Russian.* I. 3 hr. PR: Russian 1, 2, or equiv. Primarily for students in science courses.

122. *Scientific Russian.* II. 3 hr. PR: Russian 121 or consent. Continuation of Russian 121.

144. *Survey of Russian Literature.* I. 3 hr. PR: Russian 3, 4, or consent.

145. *Survey of Russian Literature.* II. 3 hr. Continuation of Russian 144.

211. *The Russian Novel.* I. 3 hr. PR: Russian 3, 4, or consent. Study of selected work of Gogol, Goncherov, Turgenev, Leskov, Dostoyevsky, and Tolstoy.

212. *The Russian Novel.* II. 3 hr. Continuation of Russian 211. Study of Russian prose from Chekhov to the post-war Soviet novelists.

*Variable credit courses normally carry 3 hr. credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

213. *Survey of Russian Literature in Translation.* I. 3 hr. PR: Junior standing or consent. Major works of Russian authors from the beginning to 1880 including those of Pushkin, Lermontov, Gogol, Turgenev, Dostoyevsky, and Tolstoy. Russian majors to read selections in the original.

214. *Survey of Russian Literature in Translation.* II. 3 hr. PR: Junior standing or consent. Continuation of Russian 213. The major literature of the Soviet Union from 1880 to the present. Russian majors to read selections in the original.

Courses of Instruction in Spanish

Spanish

Lower Division

1. *Elementary Spanish.* I, II. 3 hr.

2. *Elementary Spanish.* I, II. 3 hr. Continuation of Spanish 1.

3. *Intermediate Spanish.* I, II. 3 hr. PR: Spanish 1, 2, or equiv.

4. *Intermediate Spanish.* I, II. 3 hr. PR: Spanish 3 or consent. Continuation of Spanish 3.

21. *Elementary Spanish: Programmed Reading.* I. 3 hr. Beginning Spanish with concentration on reading comprehension.

22. *Elementary Spanish: Programmed Reading.* II. 3 hr. PR: Spanish 21 or equiv. Continuation of Spanish 21.

23. *Intermediate Spanish: Programmed Reading.* I. 3 hr. Spanish 21, 22, or equiv.

24. *Intermediate Spanish: Programmed Reading.* II. 3 hr. PR: Spanish 21, 22, 23, or equiv. Continuation of Spanish 23.

31. *Elementary Spanish: Cultural Emphasis.* I. 3 hr. Beginning Spanish with equal emphasis on the contemporary culture of Spain and Latin America.

32. *Elementary Spanish: Cultural Emphasis.* II. 3 hr. PR: Spanish 31 or equiv. Continuation of Spanish 31.

33. *Intermediate Spanish: Cultural Emphasis.* I. 3 hr. PR: Spanish 31, 32, or equiv.

34. *Intermediate Spanish: Cultural Emphasis.* II. 3 hr. PR: Spanish 31, 32, 33, or equiv. Continuation of Spanish 33.

Upper Division

103. *Advanced Spanish.* I. 3 hr. PR: Spanish 3, 4, or consent.

104. *Advanced Spanish.* II. 3 hr. PR: Spanish 103 or consent.

109. *Advanced Spanish.* I. 3 hr. PR: Spanish 104 or consent.

110. *Advanced Spanish.* II. 3 hr. PR: Spanish 109 or consent.

111. *Nineteenth Century Literature to 1870.* I. 3 hr. PR: Spanish 3, 4, or equiv.

112. *Spanish Literature Since 1870.* II. 3 hr. PR: Spanish 3, 4, or equiv.

116. *Spanish Civilization and Culture.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

117. *Spanish-American Literature.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

118. *Spanish-American Literature.* II. 3 hr. PR: 12 hr. of Spanish or equiv.

221. *Literature of the Golden Age to 1635.* I. 3 hr. PR: 18 hr. of Spanish or equiv.

222. *The Golden Age After Lope De Vega.* II. 3 hr. PR: 18 hr. of Spanish or equiv.

223. *Estudios de Estilo.* I. 3 hr. PR: 18 hr. of Spanish or equiv.

292. *Pro-Seminar.* 1-6* hr. Special topics.

315. *Lyric Poetry.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

324. *Explicacion de Textos.* II. 3 hr. PR: 18 hr. of Spanish or equiv.

325. *The Picaresque Novel.* I. 3 hr. PR: 18 hr. of Spanish or equiv.

327. *Graduate Reading in Spanish.* No credit. Special course to help students prepare for the Ph.D. reading examination in Spanish.

391. *Cervantes.* II. 3 hr. PR: 18 hr. of Spanish or consent.

392. *Seminar.* 1-6* hr. Special topics.

395. *Sixteenth Century Literature.* I. 3 hr. PR: 18 hr. of Spanish or consent.

Geology and Geography

Faculty

Alan C. Donaldson, Ph.D. (Penn. St. U.), *Chairperson; Professor of Geology.*
James Barlow, Ph.D. (U. Tenn.), *Adjunct Assistant Professor of Geology.*
Robert E. Behling, Ph.D. (Ohio St. U.), *Assistant Professor of Geology.*
Hugh Buchanan, Ph.D. (Columbia U.), *Assistant Professor of Geology.*
Robert Davis, Ph.D. (U. Pitt.), *Assistant Professor of Geography.*
Chester L. Dodson, M.S. (WVU), *Assistant Professor (p-t) of Geology.*
Robert B. Erwin, Ph.D. (Cornell U.), *Professor of Geology.*
William Gillespie, M.S. (WVU), *Instructor (p-t) in Geology.*
Milton T. Heald, Ph.D. (Harvard U.), *Professor of Geology.*
Harley Johansen, Ph.D. (U. Wisc.), *Assistant Professor of Geography.*
Richard F. Lamb, Ph.D. (U. Chicago), *Assistant Professor of Geography.*
Peggy A. Lentz, Ph.D. (Clark U.), *Assistant Professor of Geography.*
Peter Lessing, Ph.D. (U. Syracuse), *Adjunct Assistant Professor of Geology.*
Richard S. Little, Ph.D. (Syracuse U.), *Associate Professor of Geography.*
William Overbey, B.S. (WVU), *Adjunct Assistant Professor of Geology.*
Douglas Patchen, Ph.D. (U. Syracuse), *Adjunct Assistant Professor of Geology.*
Paul W. Queen, M.A. (WVU), *Instructor (p-t) in Geology.*
Henry Rauch, Ph.D. (Penn. St. U.), *Assistant Professor of Geology.*
John J. Renton, Ph.D. (WVU), *Associate Professor of Geology.*
Robert C. Shumaker, Ph.D. (Cornell U.), *Professor of Geology.*
Steven M. Warshauer, Ph.D. (U. Cincinnati), *Assistant Professor of Geology.*
Dana Wells, Ph.D. (Columbia U.), *Professor Emeritus of Geology.*
Russell L. Wheeler, Ph.D. (Princeton U.), *Assistant Professor of Geology.*
Chester E. Zimolzak, M.S. (U. Wisc.), *Assistant Professor of Geography.*

Bachelor of Science in Geology

The Bachelor of Science degree is designed for students who want to qualify for professional positions in industry and government services as well as those who plan to do graduate work in geology. A total of 134 hours is required, of which a minimum of 124 hours must be established in subjects exclusive of credits earned in required Physical Education and Math. 2. Electives must be chosen so as to meet the basic requirements of the College of Arts and Sciences.

Students are urged to elect some supporting courses in such allied fields as mining or petroleum engineering, biology, geography, soil mechanics, pedology,

*Variable credit courses normally carry 3 hr. credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

and computer science, depending on their major field of geologic studies. A total of 44 hours of non-geology electives are required of which 24 hours are needed to fulfill the Core Curriculum; the balance can be hours in geology, cognate fields, and electives of general interest to the student, with the adviser's consent.

Candidates for the Bachelor of Science in Geology are required to take a total of 40 hours of geology courses. Most students should elect Geol. 231 for optimum general development or oceanography emphasis.

Instructional facilities and equipment include the labs associated with mineralogy, petrology, geochemistry, sedimentology, paleontology, geomorphology, mineral and fuel resources, and structural geology. Field studies are stressed with geologic mapping at Camp Wood in Greenbrier County; carbonate sediments and their depositional environments in the Florida Keys; sedimentation and coastal processes on the eastern shore of Virginia; pollution measurements in nearby streams and lakes; field trips to glaciated areas; examinations of processes acting on earth's surface in West Virginia; and structural and stratigraphic analyses of the Appalachian basin and orogenic belt. Subsurface logs and samples are available for study in the West Virginia Geological and Economic Survey and the nearby Bureau of Mines.

Bachelor of Arts With a Major in Geology

The course requirements for the bachelor of arts with a major in geology are designed for students who want to go into careers that require a good background in the basic principles of geology. Areas such as environmental science, planning, or other earth-related sciences, secondary school teaching, or earth science laboratory technical work may be pursued by proper choice of electives.

After admission to the program continuance in the program for the third and subsequent semesters requires a cumulative average of 2.0 for courses in geology taken in the department.

Bachelor of Arts With a Major in Geography

It is strongly recommended that for a bachelor of arts with a major in geography students should have a strong minor in either economics, sociology, political science, history, geology, or statistics (other fields will be considered upon petition). The elective hours in the junior and senior years are to be used for this specific purpose. Students who intend to do graduate work should take at least Math. 15 in lieu of Math. 8. Statistics 101, or more advanced work in statistics, is strongly recommended.

Major in Geology — B.S.

Required Courses

Geol. 1 or 5, 2, 3, 4, 151, 184, 185, 221, 261, 266, and 8 hours of geology electives; Chem. 15 and 16; Physics 1 and 2 or 11 and 12; Math. 3, 4, 15, 16 or Stat. 102; Stat. 101; C.E. 1.

Recommended Electives

Geol. 127, 228, 231, 235, 272; C.S. 1; additional Biology, Chemistry, Physics, or Mathematics courses.

Major in Geology — A.B.

Required Courses

Geol. 1 or 5, 2, 3, 4, 127, 151, 184, 221 or 222, 231 or 235, 261; Chem. 15 and 16; Physics 1 and 2; Math. 3 and 4; science elective other than geology.

Recommended Electives

See those listed above under Geology — B.S.

Major in Geography

Required Courses

Geog. 7, 8, 105, 109, 210, 219, 220 (minimum of 6 hours) and *one* of the following: 140, 141, 240, 246; 6 hours of Geography electives; 12 hours Core B courses excluding Forestry; 8 hours science elective; Math. 3; Stat. 101.

Honors Program

Qualified students are encouraged to participate in the departmental Honors Program which begins either the second semester of the junior year or the first semester of the senior year and culminates in a senior thesis. The Honors Program is for students with a cumulative grade-point average of at least 3.0 in all courses completed by the end of the fifth semester and a grade-point average higher than 3.0 in geology. Promising students with grade-point averages slightly below 3.0 are eligible for the Independent Studies Program, with consent of a department committee.

Courses of Instruction in Geology

Geol.

Lower Division

1. *Physical Geology.* I, II. 3 hr. Description of composition and structure of earth physical processes which change earth's surface. Geol. 2 not required with Geol. 1. Registration in Geol. 2 meets requirements for 4 hr. credit in a laboratory science in physical geology. Credit cannot be obtained for both Geol. 1 and Geol. 5.

2. *Physical Geology Laboratory.* I, II. 1 hr. May be taken for credit without previous or concurrent geology background. ($10.00 lab fee.)

3. *Historical Geology.* I, II. 3 hr. PR: Geol. 1 or Geol. 5 or Conc. with consent. Evolution of earth and its inhabitants. Accompanied by Geol. 4 to meet requirements of 4 hr. credit in a laboratory science in historical geology.

4. *Historical Geology Laboratory.* I, II. 1 hr. Accompanies Geol. 3. PR or Conc.: Geol. 3. ($10.00 lab fee.)

5. *Introduction to Geology.* I, II. 3 hr. Designed especially for non-science majors. Composition and structure of earth and geologic processes which shape its surface. Geol. 2 not required with Geol. 5. Accompanied by Geol. 2 to meet requirements for 4 hr. credit in a laboratory science in physical geology. Credit cannot be obtained for both Geol. 1 and Geol. 5.

25. *Geologic Drafting.* I. 1 hr. Some drafting equipment to be purchased by student. ($10.00 lab fee.)

Upper Division

127. *Map Interpretation.* I. 2 hr. PR: Geol. 1 or 5. Relation of earth structure and history to land forms as shown on topographic maps.

151. *Structural Geology.* I. 1-4 hr. PR: Geol. 1, 2, or consent; plane geometry, high school algebra, plane trigonometry, and high school physics, or consent. Introduction to stress, strain, and related behaviors of geologic materials in nature, theory, and experiment. Descriptions and theories of brittle and ductile deformation of rocks on minor and major scales. Interpretation of rocks' observed structures as records of physical processes operating within the earth's crust.

184. *Mineralogy.* I. 4 hr. PR: Geol. 1, Chem. 15, or conc. Elements of crystallography and systematic study of minerals except silicates. Identification of minerals by their physical properties supplemented by blow-pipe analysis. ($10.00 lab fee.)

185. *Mineralogy and Petrography.* II. 4 hr. PR: Geol. 184. Description, mode of occurrence, and classification of silicate minerals and rocks. ($10.00 lab fee.)

201. *Physical Geology for Teachers.* I, II, S. 3 hr. PR: High school teaching certificate and consent. Composition and structure of earth and the geologic processes which shape its surface. Credit cannot be obtained for both Geol. 201 and Geol. 1 or 5.

202. *Physical Geology Laboratory for Teachers.* I, II, S. 1 hr. Accompanies Geol. 201. Laboratory and field study of earth materials and features, and the topographic and geologic maps used to represent them. ($10.00 lab fee.)

218. *Geology and the Earth Sciences.* I. 4 hr. PR: Geol. 151. Physical nature of the earth. Rotation, revolution, shape, and structure of the earth. Geologic forces changing the earth. Geologic history.

221. *Geomorphology.* I. 3 hr. PR: Geol. 1 or 5. An examination of the physical processes which shape the surface of the earth, with emphasis on fluvial processes and environmental geomorphology. Optional field trip at student's expense. ($10.00 lab fee.)

222. *Geomorphology.* II. 3 hr. PR: Geol. 1 or 5. A consideration of glaciology and glacial geology as pertains to erosion and deposition by glaciers. The Pleistocene history of North America is stressed. Optional field trip at student's expense. ($10.00 lab fee.)

228. *Photogeology.* II. 3 hr. PR: Geol. 127, 151, or consent. Instruction in basic and advanced techniques of air photo interpretation. ($10.00 lab fee.)

231. *Invertebrate Paleontology.* I. 4 hr. PR: Geol. 3, 4, or consent. Invertebrate fossils: biologic classification, evolutionary development, ecology, and use in correlation of strata. ($10.00 lab fee.)

235. *Introductory Paleobotany.* I, II. 4 hr. PR: Geol. 3. Resume of development of principal plant groups through the ages, present distribution, mode of occurrence and index species, methods of collection. Required Saturday field trips at student's expense. ($10.00 lab fee.)

261. *Stratigraphy and Sedimentation.* II. 3 hr. PR: Geol. 1 or consent. Study of sediments and sedimentary rocks. Field techniques stressed as data gathered and interpreted from rocks of Pennsylvanian age in Morgantown vicinity. Two-day field trip required. Basic field equipment and field trips at student's expense. ($10.00 lab fee.)

266. *Appalachian Geology Field Camp.* S. 6 hr. PR: Geol. 151, 261. Practical experience in detailed geological field procedures and mapping. Living expense in addition to tuition must be paid at time of registration.

270. *Mineral Resources.* I. 3 hr. PR: Geol. 1, 184. Description, mode of occurrence, and principles governing the formation of ore deposits.

272. *Petroleum Geology.* II. 1-4 hr. PR: Geol. 151. Origin, geologic distribution, methods of exploration and exploitation, uses and future reserves of petroleum and natural gas in the world. ($10.00 lab fee.)

290. *Geologic Problems.* I, II. 1-6 hr. (12 hr. max.). Special problems for seniors and graduates. (Sec. 10: Junior honors students; Sec. 11: Senior honors thesis.)

291. *Regional Geology Seminar.* I, II. 1-6 hr. (6 hr. max.). PR: Geol. 3, 151, 185, 261; or consent. Syntheses, and description of the regional geology of selected areas around the world, prepared and presented by the students.

294. *Introduction to Geochemistry.* II. 4 hr. PR: Chem. 16, Geol. 185, or consent. Basic review of physical and aqueous chemistry, discussion of basic geochemical processes; calcium carbonate chemistry, diagenetic processes, weathering, the silicate and iron systems.

329. *Problems in Geomorphology.* I, II. 1-4 hr.

334. *Problems in Paleontology.* I, II. 1-4 hr.

336. *Advanced Paleobotany.* I, II. 4 hr. Continuation of Geol. 235.

339. *Problems in Paleobotany.* I, II. 1-4 hr.

340. *Advanced Stratigraphy.* II. 4 hr. PR: Geol. 231. Study of principles of rock and time correlation, and their application to the stratigraphy of West Virginia. Emphasis on carbonate rocks.

344. *Clay Geology.* I, II. 2-3 hr. PR: Geol. 185, 261, 369. Study of clay mineralogy with secondary emphasis on the origin and deposition of clay minerals in the stratigraphic record.

346. *Advanced Sedimentation.* I. 4 hr. PR: Geol. 135. Origin of sedimentary rocks; principles involved in interpretation of ancient geography, climates, animals, and plants. Emphasis on detrital sediments and rocks. Required field trips at student's expense.

348. *Problems in Sedimentation.* I, II. 1-4 hr.

349. *Problems in Stratigraphy.* I, II. 1-4 hr.

351. *Tectonic Elements.* II. 3 hr. PR: Geol. 151 or consent. Theories of large scale deformational processes operating within the earth's crust and upper mantle. Study of the regional structural geology of selected orogens.

359. *Problems in Structural Geology.* I, II. 1-4 hr.

362. *Sedimentology Field Camp.* S. 3-6 hr. PR: Geol. 261 or equivalent. Field-lab course in experimental, modern, and ancient sedimentation. Living expenses in addition to tuition must be paid at time of registration. Field expenses extra.

363. *Ground-water Hydrology.* I. 3 hr. PR: Geol. 1 or consent. Study of the principles of ground-water hydrology; occurrence, development, uses, and conservation of ground-water.

369. *X-Ray Diffraction.* I, II. 3 hr. PR: Chem. 16 or consent. Theory of X-ray diffraction and application to the analysis of crystalline materials using the powder camera and X-ray diffractometer. Open to advanced students in geology, chemistry, engineering, and related fields, with consent of instructor.

371. *Economic Geology: Ore Deposits.* II. 3 hr. PR: Geol. 185. Mineral composition, geologic features, and distribution of deposits of principal useful metallic minerals.

372. *Economic Geology: Nonmetallics.* I. 3 hr. PR: Geol. 185. Occurrence, formation, and use of nonmetallic mineral substances, including building materials and chemicals.

374. *Problems in Economic Geology and Geochemistry.* I, II. 1-4 hr.

385. *Optical Mineralogy.* I. 4 hr. PR: Geol. 185 and one year of physics. Principles and practice in use of the petrographic microscope in identification of minerals. Emphasis on determination by immersion method.

386. *Petrology.* II. 4 hr. PR: Geol. 385. Composition, texture, occurrence, and origin of rocks. Study of hand specimens and thin sections.

388. *Problems in Mineralogy and Petrology.* I, II. 1-4 hr.

394. *Physical Geochemistry.* I. 3 hr. PR: Geol. 294 or consent. Phase diagrams, metamorphic facies, origin of the elements, chemical properties of ions, crystal chemistry of minerals, element distributions and geochemical cycles.

395. *Aqueous Geochemistry.* I, II. 3 hr. PR: Geol. 294 or consent. Review of basic chemical principles as they apply to aqueous geologic environments. Properties of water

and the types, sources, and controls of the common and environmentally significant chemical species dissolved in water.

393. *Aqueous Geochemistry Lab.* II. 2 hr. PR: Geol. 395 previous or concurrent. Laboratory and field methods for geochemical water analysis, significance of natural and polluted waters is emphasized. Several field trips are required to area streams.

399. *Quantitative Methods in Geo-Sciences.* II. 4 hr. PR: Stat. 101, 201, and 202 or 311, 312, and consent. Brief review and introduction to specific quantitative techniques as applied to geology and geography.

Courses of Instruction in Geography

Lower Division

1. *Introduction to Geography.* I, II. 3 hr. Basic principles of the discipline, including maps, climate, physiographc, urban, political and cultural geography. Not open to students who have completed either Geog. 7 or 8.

7. *Physical Geography.* I, II. 3 hr. Study of earth's physical regions as modified and classified by man.

8. *Human Geography.* I, II. 3 hr. Study of land use and settlement patterns resulting from man's occupying the earth, problems of race, minorities, economic development and population growth.

Upper Division

105. *Geography of Natural Resources.* II. 3 hr. Distributions of the natural resources in the United States and the factors involved in resource-development, planning of multi-functional land-use, and pollution control and abatement.

107. *Weather and Climate.* II. 3 hr. Processes of weather and patterns of climate and their significance to man.

109. *Economic Geography.* I, II. 3 hr. Earth's land use patterns and interactions that result from man's economic activities. Includes the analysis of industrial location, mineral exploitation, and agricultural patterns.

140. *Geography of Anglo-America.* I. 3 hr. Regional characteristics and problems of development.

141. *Geography of Western Europe.* I. 3 hr. Regional characteristics, problems of development, and human ecology of the area.

202. *Political Geography.* I. 3 hr. PR: Consent. Examination of spatial interrelationship of man and his environment in a political setting; population, developmental and boundary problems.

203. *Historical Geography of Anglo-America.* II. 3 hr. Exploration, settlements, and changing patterns of human occupance from the sixteenth century to the present; cultural areas and their significance.

210. *Urban Geography.* II. 3 hr. Location, development and change of urban land use patterns, urban spatial structures and contemporary urban problems.

219. *Problems in Geography.* I, II. 3 hr. PR: Consent. Independent research.

220. *Seminar in Geography.* I, II. 1-6 hr. per sem.; max. 15 hr. Includes separate seminars in urban, economic, population, physical, medical behavioral, quantitative, Appalachian, transportation, environmental, settlement, education, census, planning, cultural, resource, agricultural, and geographic model building.

240. *Geography of U.S.S.R. and Eastern Europe.* II. 3 hr. Analysis of the physical environment, human resources, and economic utilization of the region.

246. *Geography of Africa.* II. 3 hr. Systematic and regional characteristics and geographic problems of political, social, and economic development.

261. *Cartography.* I. 3 hr. Theory and practice of map design.

History

Faculty

William T. Doherty, Jr., Ph.D. (U. Mo.), *Chairperson and Professor.*
William S. Arnett, M.A. (Ohio St. U.), *Instructor.*
Wesley M. Bagby, Ph.D. (Columbia U.), *Professor.*
William D. Barns, Ph.D. (WVU), *Associate Professor.*
John A. Caruso, Ph.D. (WVU), *Professor.*
Elizabeth Cometti, Ph.D. (U. Va.), *Professor Emeritus.*
Charles W. Connell, Ph.D. (Rutgers U.), *Associate Professor.*
Harry D. Fox, M.A. (Ind. U., Pa.), *Instructor (part-time).*
Jack L. Hammersmith, Ph.D. (U. Va.), *Associate Professor.*
Ruth M. Hicks, M.A. (U. Ill.), *Lecturer.*
Elizabeth K. Hudson, Ph.D. (Ind. U.), *Associate Professor.*
Carl M. Hunt, M.A. (WVU), *Instructor (part-time).*
Daniel C. Jones, M.A. (WVU), *Instructor (part-time).*
Mortimer Levine, Ph.D. (U. Penn.), *Professor.*
Paul Lutz, M.A. (Marshall U.), *Instructor (part-time).*
William R. McLeod, Ph.D. (U. Md.), *Assistant Professor.*
Kenneth R. MacDonald, M.A. (WVU), *Instructor (part-time).*
Robert M. Maxon, Ph.D. (Syracuse U.), *Assistant Professor.*
John A. Maxwell, Ph.D. (WVU), *Assistant Professor.*
Dennis H. O'Brien, Ph.D. (U. Ill.), *Assistant Professor.*
George P. Parkinson, Jr., Ph.D. (U. Wisc.), *Assistant Professor; Curator, West Virginia Collection.*
Kurt Rosenbaum, Ph.D. (Syracuse U.), *Professor.*
Robert Schweitzer, M.A. (U. Mo.), *Instructor (part-time).*
Jacob Seitz, M.A. (WVU), *Instructor (part-time).*
David Sharpe, M.A. (U. Scranton), *Instructor (part-time).*
Douglas C. Smith, M.A. (Appalachian St. U.), *Instructor (part-time).*
Sarah R. Smith, Ph.D. (Columbia U.), *Associate Professor Emeritus.*
Michael R. Sponberg, M.A. (U. N.D.), *Instructor (part-time).*
Edward M. Steel, Jr., Ph.D. (U. N.C.), *Professor.*
Irvin Talbott, M.A. (WVU), *Instructor (part-time).*
John A. Williams, Jr., Ph.D. (Yale U.), *Associate Professor.*

Major in History

Required Courses

History majors are required to complete 12 hours in lower-division history, 18 hours in upper-division history, and 6 hours each in the related fields of economics and political science. History majors also are required to complete a minor of 9-12 upper-division hours in a related subject. Of the required 18 hours in upper-division history courses at the 100 and 200 course levels, majors should divide their course selections between American and non-American fields within Groups II and III. With the approval of his adviser and the chairperson of the department, he may elect options at the 300-course level.

Group I. Hist. 1, 2, 3, 52, 53.

Group II. Hist. 101, 103, 105, 107, 109, 117, 118, 119, 120, 121, 141, 142, 201, 202, 205, 206, 209, 210, 213, 214, 215, 216, 217, 218, 222, 225, 226, 229, 230, 241, 242.

Group III. Hist 151, 153, 155, 157, 159, 161, 251, 252, 253, 255, 257, 259, 261, 263, 264, 266, 267, 268, 269, 271, 272.

Courses of Instruction in History

Hist.

Lower Division

1. *Western Civilization: Ancient World to Middle Ages.* 3 hr. Survey of the historical development of civilization in the western world beginning with the ancient Near East c. 4000 B.C. and concluding with western Europe in the Middle Ages. c. 1300 A.D. Emphasis on political, social, cultural, and intellectual developments. Does not have to precede Hist. 2 or 3.

2. *Western Civilization: Renaissance to Congress of Vienna.* 3 hr. Continuation of Hist. 1 from about 1300 to about 1815 A.D. Does not have to follow Hist. 1 or precede Hist. 3.

3. *Western Civilization: Napoleon to Present.* 3 hr. Continuation of Hist. 2 from c. 1815 to present. Focus on western Europe, but much broader scope because of expanding influence of Europe and interaction with developing world nations. May be taken to fulfill Core Curriculum or Education requirements.

52. *Growth of the American Nation to 1865.* 3 hr. General survey of American history that examines the basic political, economic, and social forces in formation and development of United States before 1868. Emphasis on national development from independence through Civil War.

53. *Making of Modern America, 1865 to the Present.* 3 hr. General survey of American history that continues the examination of basic political, economic, and social forces in the development of the United States since the Civil War.

Upper Division

101. *History of Ancient Times: Stone Age to the Fall of Rome.* 3 hr. Ancient civilizations of the Near East and the Mediterranean emphasized.

103. *Medieval Europe: Fall of Rome to the Renaissance.* 3 hr. Historical development of civilization in Europe from 300 to c. 1300 A.D. Semi-topical approach with attention to problems of church development, cultural conflict, church-state relations, social-economic expansion, and intellectual evolution.

105. *Early Modern Europe: Renaissance to the Enlightenment.* 3 hr. Concentrates on major problems of a political and social nature which affected the course of European events between 1500-1763. Some of the problems to be analyzed are the Reformation crisis, the seventeenth century struggle for effective government in England and France, the realignment of European powers, and the rise of modern science.

107. *Revolutionary Europe.* 3 hr. Traces the development of European history from the event of the French Revolution to the end of the Franco-Prussian war. Political and social history emphasized.

109. *Twentieth Century Europe.* 3 hr. Traces the major political, economic, and social developments of Europe from World War I to the present time.

117. *History of Russia: From Kiev to Nicholas I.* 3 hr. Interdisciplinary approach integrating political, social, economic, diplomatic, and cultural studies to provide more than an introduction to the history of Russia. In-depth study of the various aspects of Russian life in an attempt to provide an understanding of the forces which produced the Russian autocracy.

118. *History of Russia: From the Emancipation to the Present.* 3 hr. Using the same approach as in Hist. 117 an attempt is made to follow the changes which turned an underdeveloped country into one of the major world powers.

119. *British Civilization to 1660.* 3 hr. Survey of the history of Britain, mainly England, from the earliest times to the Restoration. Political, constitutional, diplomatic, economic, social, religious, intellectual, and cultural developments considered.

120. *British Civilization Since 1660.* 3 hr. Survey of the history of Britain, mainly England, from the Restoration to the present.

121. *History of Modern Germany.* 3 hr. Survey of German history from the Congress of Vienna to the end of World War II. Student gains special knowledge of more specialized topics by selecting literature and writing essays on these topics.

141. *Latin American History, Colonial Period and the Wars of Independence.* 3 hr. Survey of the Aztec, Maya, and Inca cultures, the European conquests, the political, economic, and cultural institutions of the Spanish and Portuguese empires in America, and the revolutionary forces and military campaigns that led to the founding of the present Latin American republics.

142. *Latin American History Since 1824.* 3 hr. Survey of the polticial events and the economic and cultural forces of the twenty Latin American countries from the dawn of nationalism to the present day.

151. *The United States and Pennsylvania.* 3 hr. Primarily for teacher certification in Pennsylvania, but open to any student interested in the history of Pennsylvania and the part that the commonwealth has played in the development of the nation.

153. *West Virginia.* 3 hr. Survey of the historical foundations and development of West Virginia, with particular emphasis upon the growth of the government, the economy, and the traditions of the state.

155. *The American Colonial and Revolutionary Experience.* 3 hr. Detailed study of American history from 1607 to 1783 with emphasis on both the planting and maturation of the English colonies of North America. Topics covered include relations between Europeans and Indians, constitutional development, religious ferment, the colonial economy, the American Revolution and the War for Independence.

157. *The Early Republic, the United States, 1781 to 1861.* 3 hr. American history from the Revolution to the Civil War is followed in detail, with particular attention to the formation and operations of government under the Confederation and the Constitution, the development of political parties, the beginnings of industrialization, and the sectional struggles that culminated in war. Completion of Hist. 52 is advised.

159. *The United States, 1865-1918.* 3 hr. Examination of the social, intellectual, economic, political, and diplomatic development of the United States during the most intensive phase of American industrialization; special emphasis given to the ideas of selected Americans on how to cope with the increase in poverty and social malaise which accompanied this economic development; attention also given to the roots of American imperialism. Hist. 53 is recommended as preparation.

161. *Recent America, United States Since 1918.* 3 hr. The era of the 1920's, the New Deal, World War II, and a survey of developments since World War II. Primarily for non-history majors.

201. *Social and Economic History of the Middle Ages, 300-1000.* 3 hr. Topics include the social-economic crisis of the late Roman and German institutions, the Merovingian and Carolingian economies, Pirenne Thesis, and transition to feudal society. Hist. 103 recommended as preparation.

202. *Social and Economic History of the Middle Ages, 1000-1500.* 3 hr. Topics include feudal society, land and population expansion, fairs, towns, leagues, Italian leadership, crusades, church influence, black death, fourteenth century revolts, and general decline of late Middle Ages. Hist. 103, 201 recommended as preparation.

205. *The Renaissance.* 3 hr. Survey of the underlying political, economic, and social structure of fourteenth and fifteenth century Italy with concentration on the significant intellectual and cultural trends which characterized the age. Some consideration given to the problem of the impact of the early Reformation movement upon Renaissance culture.

206. *The Reformation.* 3 hr. The distinguishing theological characteristics of the major Reformation movements with concentration on the effect of religious-intellectual crisis on the political and social structure of the sixteenth century.

209. *The ABC Powers of Latin America.* 3 hr. Detailed course of the political events and of the economic and cultural institutions of Argentina, Brazil, and Chile from the dawn of independence to the present day.

210. *Modern Spain.* 3 hr. Survey of Spanish political, economic, and cultural developments from national unification under Ferdinand and Isabella to Francisco Franco. Includes Portuguese history from 1580 to 1640.

213. *Bourbon France.* 3 hr. French History from the reign of Henry IV to the reign of Louis XVI. Special attention given to the reigns of Louis XIII and Louis XIV. Political, cultural, and intellectual history emphasized.

214. *The Revolutionary-Napoleonic Era.* 3 hr. Traces French history from mid-eighteenth century to 1815. Special attention given to the background of the French Revolution of 1789, to the political and social history of the revolution, and to Napoleon's non-military achievements.

215. *European Diplomatic History, 1815 to 1919.* 3 hr. Designed to develop an understanding of the forces, men, and events which determined diplomatic relations between the major powers.

216. *European Diplomatic History, 1919 to Present.* 3 hr. Scope similar to that of Hist. 216.

217. *Diplomatic History of the U.S.S.R., 1917 to 1939.* 3 hr. Detailed study of Soviet diplomatic history, with emphasis on the view from the Kremlin balanced by the responses of other powers. An understanding of European diplomatic history is desirable.

218. *Diplomatic History of the U.S.S.R., 1939 to Present.* 3 hr. Scope similar to that of Hist. 217.

222. *Twentieth-Century Germany from Weimar to Bonn.* 3 hr. The Weimar Republic, the Third Reich, and the two German states created after World War II.

225. *History of Modern China.* 3 hr. Introduction to modern China (since 1839) with some attention to China's Confucian heritage; examines in detail the Chinese effort to modernize in the face of Western diplomatic and economic pressure; specific attention to China's Nationalist and Communist revolutionary traditions.

226. *History of Modern Japan.* 3 hr. Introduction to modern Japan (since 1868) with some attention to the development of Japanese institutions and ideas in earlier periods, especially the Tokugawa Era (1600-1868); examines the rapid pace of economic change in the nineteenth and twentieth centuries along with the important social, political, and diplomatic implications of this change.

229. *History of Africa: Pre-Colonial.* 3 hr. History of Africa from earliest man to the middle of the nineteenth century. Particular emphasis on population movement and interaction, state formation, and the development of trade in subsaharan Africa as well as the impact of such external influences as Christianity and Islam.

230. *History of Africa: European Dominance to Independence.* 3 hr. History of Africa from the middle of the nineteenth century to the 1960's. In the first half of the course, the establishment and functioning of European colonial regimes in African history, and recent interpretations in the field.

241. *English Social History, Fourteenth to Eighteenth Century.* 3 hr. Topical examination of English society from the time of Chaucer to Milton. Major topics: society in town and country, economy, politics, religion, and thought.

242. *English Social History, Eighteenth Century to the Present.* 3 hr. Topical examination of English society from the time of Queen Anne to the present.

251. *History of Black People in America to 1900.* 3 hr. Consideration given to slave trade and evolution of slavery in the New World, the attack upon slavery and its destruction, the South and the Negro during Reconstruction, and the age of Reaction and Racism, 1875-1900.

252. *History of Black People in America Since 1900.* 3 hr. Consideration given to race conflict and black migration, the blacks in American world wars, desegregation practices both in the South and the North, and trends toward black nationalism.

253. *Civil War and Reconstruction.* 3 hr. Study of the causes as well as the constitutional and diplomatic aspects of the Civil War; the role of the American Negro in slavery, in war, and in freedom; and the economic and political aspects of Congressional Reconstruction.

255. *The Cleveland Era.* 3 hr. An examination of national history during the "Gilded Age," with emphasis on the political and social impacts of urban-industrial growth. Topics include the growth of large cities and a national communications network, the rise of the corporation, the subordination of regional interests and racial minorities, political protest movements and changes in the structure and sociology of politics, with special attention to the Congress and the Presidency.

257. *The U. S. From McKinley to the New Deal, 1896 to 1933.* 3 hr. Detailed study of American national history from William McKinley to Franklin D. Roosevelt. Particular attention given to the great changes in American life after 1896; national political, economic, social, and cultural development; the Progressive Era in American politics; and alterations in American foreign relations resulting from the Spanish-American War and World War I.

259. *Recent American History, 1933 to Present.* 3 hr. Detailed study of American national history from the inauguration of Franklin D. Roosevelt to the present. Emphasis on the New Deal; on Roosevelt's foreign policies and their impact on American social, technological, and cultural developments; and on United States domestic problems and foreign relations since 1945.

261. *Economic and Social Development of West Virginia.* 3 hr. Study, primarily regional in nature, of the economic, social, technological, cultural, and religious history of West Virginia.

263. *American Diplomacy to 1918.* 3 hr. American foreign policy and diplomacy from the adoption of the Constitution to the end of World War I. Assumes some student knowledge of the period such as that obtained in Hist. 52 and 53.

264. *American Foreign Policy and Diplomacy, 1918 to the Present.* 3 hr. America's foreign policy and growing involvement in international relations including our role in World War II, the Korean War, and Vietnam. Assumes that the student has some knowledge of the period such as that obtained in Hist. 3, 53, or 161.

266. *American Economic History to 1865.* 3 hr. Covers the origins and development of American business, agricultural, and labor institutions, problems, and policies, from 1600 to 1865; and studies the influence of economic factors upon American history during this period.

267. *American Economic History Since 1865.* 3 hr. Covers 1865 to the present. Scope similar to that stated for Hist. 266.

268. *The Old South.* 3 hr. Examination of the history of one section of the United States — the South — exploring the peculiar differences that led to an attempt to establish a separate nation. The geographical limitation permits a detailed study of economic and social forces within the context of the larger national history. For advanced undergraduates and graduates.

269. *The New South.* 3 hr. Study of the integration of the South into the nation after the Civil War. Emphasis upon southern attitudes toward industrialization, commercial agriculture, organized labor, and the Negro. Special attention given to the southern literary renaissance and conservative and progressive politics of the southern people.

271. *The American Frontier East of the Mississippi.* 3 hr. Detailed course of westward expansion from the discovery of America to the Louisiana Purchase. Emphasis on frontier section in the region from the Tidewater to the Mississippi Valley.

272. *The American Frontier West of the Mississippi.* 3 hr. Continuation of westward expansion from the Louisiana Purchase to the passing of the frontier in 1893. Original investigation and reassessment of a number of controversial problems.

Program for the Humanities

Manfred O. Meitzen, Ph.D. (Harvard U.), *Chairperson of Humanities and Professor of Religious Studies.*

The study of humanities means pursuing the accumulated knowledge and experience contained in world literature, history, fine arts, religion, and philosophy in an interdisciplinary framework with the objective of bringing the student to an active consciousness of the living, operating, and continuing values in human culture.

Courses of Instruction in the Humanities

Humanities

Lower Division

1, 2. *Introduction to the Course of Western Civilization.* I, II. 3 hr. per sem. First semester treats the high points of Greco-Roman and Medieval European civilizations: their art, architecture, philosophy, religion, literature, and culture. Second semester shows how these ideas and achievements were modified and added to during the Renaissance, the Age of Classicism, and the revolutionary nineteenth century to give us the world we know today. Sir Kenneth Clark's film series *Civilization* will be shown during the year and other audio-visual performances will help enlighten the student. Each student attends a discussion group limited to about twenty.

3, 4. *Seminar.* I, II. 1 hr. per sem. Honors course for selected students already in Humanities 1 and 2. Affords participants a wider opportunity for discussion than in Humanities 1 and 2, as well as the chance to earn extra credit.

10. *The Classic Forms of the Hero in Western Civilization.* I. 3 hr. Courage and the classic forms of the hero in the twentieth century. Historical study of art, literature, philosophy, and religious thought from the Greek classics to contemporary novels and films. Two lectures, one discussion per week.

11. *The Figure of the Absurd Hero in Western Civilization.* II. 3 hr. Courage and the figure of the "absurd hero" in the twentieth century. Historical study of literature, art, religion, and philosophy from the New Testament to contemporary novels and films. Two lectures, one discussion per week.

Upper Division

101. *Classical Culture in the Modern World.* I. 3 hr. Interdisciplinary course introduces the student to classical culture through study of Greco-Roman art, religion, philosophy, science, and law, as well as daily life and customs, and their influence upon the present day.

102. *Classical Myths in the Modern World.* II. 3 hr. Interdisciplinary course introduces the student to classical myths of gods and heroic legends and their influence upon modern culture.

150, 151. *Humanities in a Technological Society.* I, II. 3 hr. per sem. PR: Sophomore standing or above. Courses meet the needs of students of humanities for an understanding of the nature of technology, its rise, progress, and future prospects. Through an interdisciplinary team, composed of a technologist, humanist, and social scientist, the courses consider the social, religious, and philosophical and artistic responses of man to his technological milieu.

181, 182. *American Civilization.* I, II. 3 hr. per sem. Salient characteristics of American civilization as they have developed since the planting of European colonies on this continent. Emphasis on unique contributions of successive arrivals on American shores to the making of the distinctive American culture, as evidenced in its folkways, arts, and philosophy. Central theme of the course is the manifestation of the democratic spirit in the thought and feelings of the American people.

250. *Culture Tour of Europe.* S. 6 hr. PR: Some cultural background in European civilization such as Humanities 1, 2, Hist. 1, 2, 3, art survey courses, or equiv., or consent.

260. *Culture Tour of Latin America.* S. 6 hr. PR: Some cultural or historical background in Latin America, such as history or art courses, or consent.

270. *Cradle of History Tour of the Near East.* S. 6 hr. PR: Humanities 1, 2, Hist. 1, 2, 3, or equiv., or consent.

280. *Around-the-World Culture Tour.* S. 6 hr. PR: Course in world or western civilization, such as Humanities 1, 2, Hist. 1, 2, 3, or consent.

Library Science

Faculty

Robert F. Munn, Ph.D. (U. Mich.), *Chairperson and Professor; Director of Libraries.*

Stokely B. Gribble, M.S.L.S. (U. Ky.), *Assistant Professor; Assistant Director of Libraries.*

Clifford C. Hamrick, M.L.S. (Rutgers U.), *Assistant Professor; Chief Reference Librarian.*

Theodore M. Judy, M.A.L.S. (WVU), *Assistant Professor; Physical Science Librarian.*

Geraldine Katz, M.L.S. (U. Md.), *Instructor; Junior Reference Librarian.*

Evelyn M, Kocher, M.S.L.S. (U. N.C.), *Assistant Professor; Chief Catalog Librarian.*

Victorine A. Louistall, M.A.L.S. (WVU), *Assistant Professor.*

Barbara Mertins, M.S.L.S. (Syracuse U.), *Assistant Professor.*

Mildred I. Moyers, M.S.L.S. (West. Reserve U.), *Assistant Professor; Chief Bibliographer.*

Program

Courses in undergraduate library science are designed for students preparing to qualify for state certification as teacher-librarians in public school, students who desire a general program in library science, and students who are interested in preparing for graduate study in librarianship. Additional requirements for school librarians include: Teacher certification on the secondary or elementary level. See the College of Human Resources and Education.

Major in Library Science

Required Courses

Lib. Sci. 201, 203, 205, 222, 223.

Recommended Electives

Lib. Sci. 1, 207, 224, 235, 326, 327, 330.

Courses of Instruction in Library Science

Lib. Sci.

1. *Using Books and Libraries.* I, II, S. 3 hr. Planned to give working knowledge of library facilities, particularly of the University Library. General reference sources, basic principles of cataloging, and departments of the library are studied. A course that is useful to any student in the University.

201.* *Reference and Bibliography.* I, II, S. 3 hr. PR: Consent. Basic reference books, dictionaries, encyclopedias, indexes, yearbooks, and other reference materials are studied and evaluated, with emphasis on the theory and practical experience with reference books. Required for Library Science majors.

203.* *Library Materials for Children.* I, II, S. 3 hr. Survey of children's literature in the light of historical development, with emphasis on current trends. Consideration of the criteria for and means of evaluating print and nonprint materials for support of the curriculum, recreation, and child guidance.

205.* *Selection of Books and Related Materials for the Secondary School Library.* I, II, S. 3 hr. Survey of adolescent literature and other library materials adapted to the needs of junior and senior high school students.

207.* *Organization and Administration of the Instructional Materials Center in the Secondary School.* I, S. 3 hr. PR: Lib. Sci. 205, 223. For school librarians. Study of organization and administration, including planning, equipment, routines, and schedules, and the role of the librarian in the instructional program.

222.* *Field Practice.* I, II, S. 3 hr. PR: Lib. Sci. 201, 203, 205, 207, or 223, 235. Practical experience in a variety of public, school, and special libraries, and instructional materials centers, under the supervision of experienced librarians and media specialists. Students must complete 100 clock hours.

223.* *Cataloging and Classification.* I, II, S. 3 hr. Basic principles and problems of cataloging and classification combined with practical experience in processing the various types of books and materials. Problems peculiar to the teacher-librarian considered.

224. *History of Books and Libraries.* I, S. 3 hr. Survey course, including the development of the book from early manuscript form, history of printing, book illustration, bindings, and the library and its development.

235.* *Organization and Administration of the Instructional Materials Center in the Elementary School.* II, S. 3 hr. PR: Lib. Sci. 223. For school librarians. Includes planning quarters; selection, acquisition, and organization of books and other mate-

*Presently required for certification in the State of West Virginia.

rials; supervision of library assistants; relations with faculty, administration, and community.

326. *Literature of the Social Sciences.* I, S. 3 hr. PR: Consent. Bibliographic and reference sources in the social sciences. Course designed to give the student a good working knowledge of the major sources of information in the social sciences and the ability to make effective use of the library.

327. *Literature of the Humanities.* I, S. 3 hr. Bibliographic and other reference sources in the major subject areas of the humanities, including religion, philosophy, fine arts, music, and literature.

328. *Literature of Science and Technology.* II, S. 3 hr. PR: Consent. Designed to give the student a good working knowledge of the increasingly complex literature of science and technology.

330. *Library Resources for the School Curriculum.* II. 3 hr. Library and community resources, print and non-print, for curriculum enrichment. Presented to elementary and secondary teachers and to librarians to help them give more effective services.

Mathematics

Faculty

Iland D. Peters, M.S. (WVU), *Chairperson and Professor.*
Marsha M. Brumley, M.A. (LIU), *Instructor.*
Oleg Carleton, Ph.D. (U. Calif., S. Barbara), *Instructor.*
Ruth Q. Carleton, M.A. (U. Calif, S. Barbara), *Instructor.*
Anand M. Chak, Ph.D. (Lucknow U., India), *Professor.*
Jean M. Coover, M.A. (WVU), *Instructor.*
Allen B. Cunningham, Ph.D. (WVU), *Professor.*
Hannibal A. Davis, Ph.D. (Cornell U.), *Professor Emeritus.*
James B. Derr, Ph.D. (Mich. St. U.), *Assistant Professor.*
James R. Dosier, M.S. (Temple U.), *Assistant Professor.*
James E. Dowdy, Ph.D. (Okla. St. U.), *Assistant Professor.*
Joy B. Easton, M.S. (WVU), *Assistant Professor.*
James C. Eaves, Ph.D. (U. N. C.), *Centennial Professor.*
Helen L. Godfrey, M.S. (WVU), *Instructor.*
Jack T. Goodykoontz, Ph.D. (U. Ky.), *Instructor.*
Henry W. Gould, M.A. (U. Va), *Professor.*
Judith C. Hall, M.S. (Harvard U.), *Instructor.*
Lois V. Heflin, M.S. (WVU), *Instructor.*
Dora F. Hennen, M.S. (WVU), *Instructor.*
D. Michael Henry, Ph.D. (TCU), *Assistant Professor.*
Franz X. Hiergeist, Ph.D. (U. Pitt.), *Associate Professor.*
Jody N. Hinds, M.S. (WVU), *Instructor.*
Caulton L. Irwin, Ph.D. (Emory U.), *Assistant Professor.*
Alonzo F. Johnson, Ed.D. (Okla. St. U.), *Associate Professor.*
Jin B. Kim, Ph.D. (VPI), *Associate Professor.*
Wilma J. Loudin, M.S. (WVU), *Instructor.*
Betty L. Miller, M.S. (WVU), *Assistant Professor.*
James E. Miller, Ph.D. (U. Ky.), *Assistant Professor.*
Narayan P. Mukherjee, Ph.D. (Mich. St. U.), *Assistant Professor.*
John W. Randolph, Ph.D. (U. Va.), *Associate Professor, Associate Chairperson.*
Donald F. Reynolds, Ph.D. (TCU), *Assistant Professor.*

John W. Schleusner, Ph.D. (U. Ala.), *Assistant Professor.*
William H. Simons, Ph.D. (Carnegie-Mellon U.), *Assistant Professor.*
Joseph K. Stewart, Ph.D. (WVU), *Professor Emeritus.*
Charles H. Vehse, Ph.D. (Brown U.), *Professor Emeritus.*
Marvin L. Vest, Ph.D. (U. Mich.), *Professor Emeritus.*

Programs

The Department of Mathematics provides a curriculum which contains programs for an undergraduate major in mathematics, for the pre-service elementary and secondary teacher, for the student who is interested in the applications of mathematics to the fields of computer science, statistics, engineering, physical, natural and social science, and business and economics. Also included in the curriculum are courses designed to acquaint the non-science major with the ideals and objectives of mathematics.

The department cooperates with other WVU units in maintaining in its curriculum courses relevant to the needs of their students.

Freshmen and sophomores who plan to major in mathematics and who also wish to meet the requirements for certification as secondary teachers of mathematics should plan their programs carefully in order to meet both sets of requirements within the four academic years.

Students who expect to major in mathematics should maintain a grade-point average of not less than 2.5 in lower-division mathematics course work.

Placement examinations for freshmen will be given during the summer orientation program and just before registration for the first semester of the academic year. The department, on request from a high school principal, will provide placement test service at the high school during the latter part of the second semester for interested graduating seniors.

Entering students also may be placed on the basis of scores made on Advanced Placement Examinations (College Entrance Examination Board) and ACT scores.

Students who are registered at WVU may earn credit for a number of mathematics courses by examination. Examinations will be given at two separate times during each semester. Information concerning the regulations pertaining to credit by examination, courses listed, where and when to apply, time and place of examinations may be obtained from the Academic Advising Center.

Major in Mathematics

Required Courses

Math. 3 and 4 or 14, if student does not have equivalent preparation upon entering into the program; Math. 15, 16, 51, 141, 163, 181, 241, 251, 252.

Recommended Electives

Nine (9) hours, including at least one course in geometry, or number theory; Math. 113, 161, 168, 215, 239, 256, 261, 263, 269, 271, 292-292.

Courses of Instruction in Mathematics

Math.

Pre-College

0. *Elementary Algebra.* I and II. ½ unit per sem. A two-semester course equivalent to first-year high school algebra. This course is offered to enable students to remove entrance conditions in mathematics. This course carries no University credit, al-

though it is considered equivalent to three hours per semester in calculating student course loads. Self-instruction programmed course materials are available on a rental basis.

1. *Geometry.* I and II. ½ unit per sem. A two-semester course covering the usual material of high school plane and solid geometry. This course is offered to enable students to remove entrance conditions in mathematics. This course carries no University credit, although it is considered equivalent to three hours per semester in calculating student course loads. Self-instruction programmed course materials are available on a rental basis.

2. *Algebra.* I, II. 3 hr. PR: 1 unit albegra. Credits earned in Math. 2 are not counted in the 128 hours required for graduation by the College of Arts and Sciences.

Lower Division

3. *College Algebra.* I, II. 3 hr. PR: 1½ units algebra or Math. 2, and 1 unit geometry. Not open to students who have credit for the equivalent of Math. 14.

4. *Plane Trigonometry.* I, II. 3 hr. PR: 1½ units algebra or Math. 2, and 1 unit geometry. Not open to students who have credit for the equivalent of Math. 14.

14. *Pre-Calculus Mathematics.* I, II. 4 hr. PR: 2 units algebra and 1 unit geometry. A treatment of algebra, analytic geometry, and trigonometry necessary for the study of calculus. Not open to students who have credit for the equivalent of either Math. 3 or Math. 4.

15, 16. *Single Variable Calculus I and Single Variable Calculus II.* I, II. 4 hr. per sem. PR: 2 units algebra, ½ unit trigonometry, or Math. 3 & 4, or Math. 14. An introduction to plane analytic geometry, and an intuitive but thorough development of the calculus of one variable including infinite series and the solution of some basic differential equations.

17. *Applied Mathematics 1.* I, II. 4 hr. PR: Math. 16. Primarily for engineers and scientists. Ordinary differential equations, Laplace transforms, matrices. Applications to physics, chemistry, and engineering.

18. *Applied Mathematics 2.* I, II. 4 hr. PR: Math. 17. Primarily for engineers and scientists. Calculus of several variables, line and surface integrals, Fourier series, partial differential equations, probability and statistics. Applications.

21, 22. *Introduction to Mathematics.* I, II. 2 hr. per sem. PR: 1 unit algebra. Course is designed for students who are not science or mathematics majors, and who do not need the techniques of mathematics for other course work in their programs. Topics in modern mathematics.

28. *Finite Mathematics.* I, II. 3 hr. PR: Two years high school algebra or Math. 3. Logic, sets, partitions, probability theory, vectors, matrices, linear programming and applications in commerce.

33, 34. *Introductory Mathematics for Elementary Teachers.* I, II. 3 hr. per sem. PR: One unit high school algebra. For elementary education majors. Structure of the number systems; techniques of arithmetic computation derived from the properties of the real number system; informal geometry.

51. *Multivariables Calculus.* I, II. 4 hr. PR: Math. 16. An introduction to solid analytic geometry, the calculus of several variables; and introduction to differential equations.

Upper Division

113. *Differential Equations.* I, II. 3 hr. PR: Math. 18 or 51. Analysis of ordinary differential equations including: existence and uniqueness of solutions; methods of solution; oscillatory, stability and asymptotic properties of solutions; boundary value problems, linear and non-linear systems.

116. *Introduction to the Laplace Transform.* II. 3 hr. PR: Math. 18 or 51. Introduction at the undergraduate level to the theory and application of the Laplace transform.

121. *Digital Computer Programming.* I, II. 1 hr. PR: Math. 3. Preparation and execution of FORTRAN computer programs.

123. *Introduction to Numerical Procedures.* I or II. 3 hr. PR: C.S. 2 and Math. 16. Introduction to numerical algorithms fundamental to scientific computing. Includes discussion of error, polynomial interpolation, quadrature, linear and nonlinear systems of equations. Efficient use of the computer is emphasized. (Equiv. to C.S. 120)

125. *Theory of Games.* II. 3 hr. PR: Math. 16 or consent. Elements of matrix algebra and probability. Theory of games, including decision theory, linear and dynamic programming, and strategy.

131. *Structure of the Real Numbers.* I, II. 3 hr. PR: Math. 34. For elementary education majors. The real numbers as a complete ordered field and its subsystems. Linear and quadratic equations and inequalities, modular arithmetic, functions, matrices, complex numbers, and algebraic structures.

132. *Informal Geometry for Elementary Teachers.* I, II. 3 hr. PR: Math. 131, or consent. For elementary education majors. Logic, finite geometries, and an informal approach to the concepts of congruence, similarity, parallelism, measure, symmetry, symmetry groups, and coordinate geometry as related to Euclidean geometry.

133. *Introductory Modern Algebra for Teachers.* I, II. 3 hr. PR: Calculus or consent. Not open to students with credit for Math. 141. The basic number systems, decomposition of integers, modular systems, groups, rings, domains, fields, polynomial rings, matrices, vector spaces, linear transformations.

138. *Modern Geometry for Teachers.* I. 3 hr. PR: Math. 16 or consent. For prospective high school mathematics teachers. Foundations of geometry. Special topics from Euclidean, projective, and non-Euclidean geometries.

141. *Introduction to Algebraic Structures.* I, II. 3 hr. PR: Math. 163 or consent. A study of groups, rings, and fields together with their substructures, quotients and products, morphisms; the fundamental homomorphism theorems.

161. *Mathematical Logic I.* I. 3 hr. PR: Phil. 2, or Math. 15, or consent. The logic of statements, relations and identity; introduction to the notions of consistency, completeness and decidability. (Equiv. to Phil. 106.)

163. *Introduction to the Concepts of Mathematics.* I, II. 3 hr. PR: Math. 16 or consent. Elementary logic, basic set theory, relations and functions, equivalence relations and decomposition of sets, order relations, cardinality. Emphasis on learning to prove theorems.

168. *History of Mathematics.* II. 3 hr. PR: Math. 15. Survey of the development of mathematics through the calculus, with emphasis on the mathematical theories and techniques of each period and their historical evolution.

181. *Topology.* I, II, S. 3 hr. PR: Math. 163 or consent. An introduction to metric and topological spaces. Topics include continuity, convergence, separation, compactness and connectedness.

214. *Vector Analysis.* I, II. 3 hr. PR: Math. 18. Primarily for engineers and scientists. Vector algebra, differential operators, curvilinear coordinate systems, Stokes' and Gauss' theorems, applications, linear systems of equations, matrices, determinants, quadratic forms, eigenvalues and canonical forms, and numerical inversions.

215. *Applied Modern Algebra.* II. 3 hr. PR: Consent. Introduction to graph theory, Boolean algebras, monoids, finite-state and Turing machines with applications to computer design, algebraic coding theory and computer language, especially ALGOL.

219. *Seminar in Applied Mathematics.* I, II. 1-12 hr.

223. *Applied Matrix Algebra.* I. 3 hr. PR: Math. 18 or 51. Matrix and vector space review, theory and computer computation of characteristic roots and vectors, theory and computation of generalized inverses and other methods of solving systems of linear equations, orthogonal and other special matrices, patterned matrices, applications in statistics. (Equiv. to Stat. 223, C.S. 223.)

226. *Mathematical Statistics.* II. 3 hr. PR: Math. 18 or 51. Discrete and continuous variables, correlation, regression, sampling theory, normal, chi-square, t, and F distributions; significance tests; analysis of variance.

231, 232. *Introduction to Mathematics for the Elementary Teacher.* I, II. 3 hr. per sem. PR: Math. 34 or consent. Not open to students who have credit for Math. 131, 132. Course is designed especially for inservice elementary mathematics teachers. Systems of numeration; sets, relations, binary operations, decimal and other base systems; natural numbers, integers, rational numbers, and real numbers with emphasis on the algebraic structure of each; the notions of length, area, and volume: Pythagorean theorem; and coordinate geometry.

239. *Elementary Number Theory.* II, S. 3 hr. PR: Math. 16 or Math. 131 or consent. A study of divisibility, congruences, linear and quadratic diophantine equations, number theoretic functions, and applications of number theory to other areas of mathematics.

241. *Introduction to Linear Algebra.* I, II. 3 hr. PR: Math. 163 or consent. A study of vector spaces, subspaces, quotient spaces, direct sums, linear transformations, fundamental isomorphism theorems, matrix representations, dual spaces, canonical forms. Multilinear algebra (i.e. bi-linear functions, determinants).

251, 252. *Introduction to Real Analysis.* I, II. 3 hr. per sem. PR: Math. 163 or consent. A study of sequences, convergence, limits, continuity, definite integral, and derivative, differentials, functional dependence, multiple integrals, sequences and series of functions.

255. *Advanced Real Calculus.* S. 3 hr. PR: Math. 51 or consent. Limits, series, metric spaces, uniformity, integrals.

256. *Complex Variables.* II. 3 hr. PR: Math. 18 or 51. Complex numbers, functions of a complex variable; analytic functions; the logarithm and related functions; power series; Laurent series and residues; conformal mapping and applications.

261. *Mathematical Logic II.* II. 3 hr. PR: Phil. 106 or Math. 161 or consent. A more formal and rigorous approach to the material covered in Phil. 106; selected problems in the philosophy of mathematics and the philosophy of logic. (Equiv. to Phil. 206.)

263. *Pro-seminar.* I, II, S. 3 hr. PR: Consent. An introduction to the foundations of mathematics via axiomatic set theory and cardinal and ordinal numbers, with emphasis on applications to other parts of mathematics.

265. *Introduction to Metamathematics I.* I. 3 hr. PR: Consent. Survey of the methodology of the deductive sciences with emphasis on the theory of proof and effective operations therein.

266. *Introduction to Metamathematics II.* II. 3 hr. PR: Math. 265. Course deals with recursive function theory. Godel's proof and associated results.

269. *Advanced Topics in Mathematics.* I, II, S. 3-9 hr. PR: Consent. An independent but directed study program, the content of which is to be mutually agreed upon by the individual student and instructor.

271. *Projective Geometry.* II. 3 hr. PR: Math. 141, 241, or consent. Projective and affine spaces, transformation groups for planes. Introduction to axiomatic plane geometries.

291, 292. *Theory of Probability.* I, II. 3 hr. per sem. PR: Math. 18 or 51. Fundamental theorems. Development of density and distribution functions in the discrete and continuous cases. Classical problems and solutions. Moments, characteristics functions, limit theorems. Applications.

Philosophy

Faculty

Ralph W. Clark, Ph.D. (U. Colo.), *Assistant Professor.*
John R. Cresswell, Ph.D. (Cornell U.), *Professor Emeritus.*
Gene A. D'Amour, Ph.D. (U. Minn.), *Assistant Professor.*
Theodore M. Drange, Ph.D. (Cornell U.), *Associate Professor.*
William S. Haymond, Ph.D. (St. Louis U.), *Professor.*
Patricia S. Long, M.A. (WVU), *Instructor (part-time).*

Program

The four lower-division courses in philosophy (Phil. 1, 2, 3, 4) are recommended for all students. They are designed to help the student learn how to think and reason properly, and to provide him with an understanding and appreciation of the most profound and challenging problems ever to confront man's intellect.

The major curriculum in philosophy is designed to enable students to do more concentrated work in the field. It would either prepare them for eventual graduate work in philosophy after obtaining the bachelor's degree at WVU or allow them to pursue their special philosophical interests as an undergraduate (or both).

Major in Philosophy

Required Courses

36 hr. of Philosophy. Majors must earn at least a C in each of following nine courses: Phil. 1, 3, 101, 102, 106, 108, 171, 103 or 115; 166 or 172 or 206.

Courses of Instruction in Philosophy

Phil.

Lower Division

1. *Introduction to Logic I.* I and II. 3 hr. A study of nonformal techniques useful for analyzing sentences and evaluating arguments in both ordinary and scientific discourse.

2. *Introduction to Logic II.* I and II. 3 hr. Syllogistic logic and elementary symbolic logic.

3. *Introduction to Philosophy.* I and II. 3 hr. A study of basic problems associated with such topics as free-will, God, immortality, mind and body, social values, linguistic analysis, and knowledge.

4. *Introduction to Ethics.* I or II. 3 hr. Consideration of answers to questions such as, How ought we live? What type of life is best? What are our moral responsibilities?

Upper Division

101. *History of Ancient Philosophy.* I. 3 hr. Major philosophies of the western world from the pre-Socratics to Plotinus.

102. *History of Modern Philosophy.* II. 3 hr. PR: Phil. 101 or consent. Major philosophies of the western world from Descartes to Kant.

103. *History of Medieval Philosophy.* I or II. 3 hr. Major philosophies of the western world from Augustine to William of Occam.

106. *Mathematical Logic I.* I. 3 hr. PR: Phil. 2 or Math. 15 or consent. The logic of statements, relations and identity; introduction to the notions of consistency, completeness and decidability. (Equiv. to Math. 161.)

108. *Ethical Theory.* I or II. 3 hr. Topics in metaethics. Problems connected with the justification and meaning of ethical statements.

114. *Recent Philosophy I.* I. 3 hr. PR: Phil. 102 or consent. Major speculative philosophies of the western world from Hegel to Whitehead.

115. *Recent Philosophy II.* I or II. 3 hr. PR: Phil. 3 or consent. A survey of the major twentieth century analytical philosophers.

121. *Existentialism.* I or II. 3 hr. Survey of the major existentialist thinkers.

122. *Philosophies of Asia.* I or II. 3 hr. The philosophies developed in Islamic countries, in India, and in China.

123. *Philosophy of Religion.* I or II. 3 hr. Major philosophical problems associated with religion.

130. *Aesthetics.* II. 3 hr. Philosophical problems associated with the nature of beauty, the nature of arts, and the justification of aesthetic evaluation.

150. *Social and Political Philosophy.* I or II. 3 hr. Application of moral concepts to questions concerning the individual and the state.

158. *Philosophy of Science.* I or II. 3 hr. Philosophical problems associated with the concepts and methodology of science.

166. *Metaphysics.* I or II. 3 hr. PR: Phil. 1, 3, or consent. Traditional problems associated with reality and experience, universals and particulars, causality, space and time, matter and mind, the nature of the self.

171. *Theory of Knowledge I.* I or II. 3 hr. PR: Phil. 1. The definition of knowledge. Close examination of skepticism of induction, perception, memory, and introspective knowledge.

172. *Theory of Knowledge II.* I or II. 3 hr. PR: Phil. 1. Consideration of the question "What is truth?" Investigation of the nature and basis of *a priori* knowledge.

183. *Philosophy of History.* I or II. 3 hr. Theoretical problems such as the nature of historical explanation, relativism, and the status of speculative principles of history.

185. *Philosophy of Language.* I or II. 3 hr. PR: Phil. 1. Philosophical problems concerning the nature of meaning and language.

187. *Philosophy of Mind.* I or II. 3 hr. PR: Phil. 3. The nature of mind and its relation to the body. Other minds. Analysis of mental concepts.

206. *Mathematical Logic II.* II. 3 hr. PR: Phil. 106 or Math. 161 or consent. A more formal and rigorous approach to the material covered in Phil. 106; selected problems in the philosophy of mathematics and the philosophy of logic. (Equiv. to Math. 261.)

223. *Philosophy of Religion.* I or II. 3 hr. PR: Phil. 123 or consent. Advanced topics in the philosophy of religion.

250. *Social and Political Philosophy.* I or II. 3 hr. PR: Phil. 150 or consent. Advanced topics in social and political philosophy.

253. *Philosophy of Mathematics.* I or II. 3 hr. PR: Phil. 106 or consent. Contemporary viewpoints in the foundations of mathematics.

258. *Philosophy of the Social Sciences.* I. 3 hr. Philosophical problems associated with the concepts and methodology of the social sciences.

264. *Empiricism.* I or II. 3 hr. PR: Phil. 102. Locke, Berkeley, and Hume.

268. *Rationalism.* I or II. 3 hr. PR: Phil. 102. Descartes, Spinoza, and Leibniz.

289. *Advanced Topics in Logic.* I or II. 3 hr. PR: Phil. 206 or consent.

Physical Sciences

The course in physical sciences has two main objectives: to serve as orientation for students who have not chosen their major field, and to present to those students who are not majoring in science a meaningful view of the methods, philosophy, accomplishments and limitations of science. Computation, essential to understanding certain modes of scientific thought, is not disdained; but any mathematical background beyond the minimum required for college admission is presented in the course itself.

A limited number of problems and propositions in astronomy, chemistry, geology, and physics are examined in some detail. It is considered more important to illustrate in actual practice the interrelations of the sciences (and the relationship of science to the whole of human experience) than to cover exhaustively the entire body of scientific information.

Students who have successfully completed as much as 8 hr. of chemistry or physics or geology cannot take Phys. Sci. 1 and 2 for credit. Three hours of lecture, one (optional) period of discussion, and one 2-hr. laboratory-demonstration period each week.

Courses of Instruction in the Physical Sciences

Phys. Sci.

Lower Division

1, 2. *Introductory General Course.* I, II. 4 hr. per sem. Phys. Sci. 1 is not prerequisite to Phys. Sci. 2; in certain curricula either semester may be taken without the other, although the sequence Phys. Sci. 1, 2 best meets the objectives of the course. (Lab fee $10.00.)

Physics

Faculty

Arthur S. Pavlovic, Ph.D. (Penn. St. U.), *Chairperson and Professor.*
Atam P. Arya, Ph.D. (Penn. St. U.), *Associate Professor.*
Stanley Farr, M.S. (WVU), *Assistant Professor.*
Martin V. Ferer, Ph.D. (U. Ill.), *Assistant Professor.*
Fred M. Goldberg, Ph.D. (U. Mich.), *Assistant Professor.*
William E. Greig, Ph.D. (U. Ill.), *Assistant Professor.*
Oleg Jefimenko, Ph.D. (U. Ore.), *Professor.*
Arnold D. Levine, Ph.D. (Columbia U.), *Professor.*
Albert E. Rainis, Ph.D. (U. Notre Dame), *Assistant Professor.*
Carl A. Rotter, Ph.D. (Case Tech.), *Associate Professor.*
Mohindar S. Seehra, Ph.D. (U. Rochester), *Associate Professor.*
Charles D. Thomas, Ph.D. (U. Chicago), *Professor.*
Charles D. Thomas, Jr., M.S. (WVU), *Instructor.*

Richard P. Treat, Ph.D. (U. Calif.), *Assistant Professor.*
William E. Vehse, Ph.D. (Carnegie-Mellon U.), *Professor.*
Douglas B. Williamson, Ed.D. (Columbia U.), *Associate Professor.*

Programs

The various programs and courses offered in physics are designed to lay a foundation for professional training of physicists, and to meet the needs of students majoring in areas where a background in physics is desirable. The department also offers courses of interest and value to a broad range of students in areas of general physics, education, physical science, photography, astronomy, and meteorology.

Major in Physics — B.S.

The Bachelor of Science degree is intended for students who want to qualify for professional positions in industry and government as well as for those who plan to do graduate work in physics; 136 hours are required.

Required Courses

Physics 5, 11, 12, 124, 231, 233, 234, 241 (3 hr.), 251, 283, electives (3 hr.); Math. 15, 16, 17, 18 or 51, 113; Electives (3 hr.); Chem. 15, 16 or 17, 18; French, German, or Russian.

Recommended Electives

Computer Science courses, Advanced Mathematics courses, other science and engineering courses.

Major in Physics — A.B.

The Bachelor of Arts degree with a major in physics is intended for students who want a foundation in physics but with a wider choice of elective subjects than is possible for those who enter the field at a professional level. The A.B. degree is well suited for those desiring to teach at the secondary level; 128 hours is required.

The first two years of study is the same for the A.B. degree and the B.S. degree except that Math. 18 may be replaced by a suitable mathematics elective.

Required Courses

Physics 5, 11, 12, 124, 231, 233, 234, 241 (2 hr.), 283; Math. 15, 16, 17, electives (3 hr.); Other science, 8 hr.

Recommended Electives

There are no restrictions of electives.

Courses of Instruction in Physics

Physics

Lower Division

1. *Introductory Physics.* I, II. 4 hr. Plane geometry and algebra. Mechanics, sound, heat and thermodynamics. ($10.00 lab fee.)

2. *Introductory Physics.* I, II. 4 hr. PR: Physics 1. Electricity, magnetism, optics and light. ($10.00 lab fee.)

5. *Conceptual Development in Physics.* I. 3 hr. Primarily designed for physics majors. Historical developments of concepts in physics.

11. *General Physics.* I, II. 4 hr. PR: Math. 15. Not open to students who have credit for Physics 1. Mechanics, sound, heat, and thermodynamics. ($10.00 lab fee.)

12. *General Physics.* I, II. 4 hr. PR: Physics 11, Math. 16. Not open to students who have credit for Physics 2. Light, optics, electricity, and magnetism. ($10.00 lab fee.)

Upper Division

113, 114. *Introductory Electronics.* I, II. 3 hr. per sem. PR: 1 year college physics. Principles of electronics, theory and practice, with applications and laboratory.

116. *Photography.* I, II. 3 hr. PR: 1 year college physics, 1 year college chemistry. Physics and chemistry of photography with practical application. ($10.00 lab fee.)

117. *Descriptive Meteorology.* I. 3 hr. PR: 1 year college physics or physical science. The atmosphere and its weather. Reading and analysis of weather maps. Weather observations. Special topics of current or particular interest.

118. *Physical Meteorology.* II. 3 hr. PR: Physics 117 or equiv. The physics of the atmosphere. Analysis of surface and upper air charts. Forecasting.

124. *Modern Physics for Engineers.* I, II. 4 hr. PR: Physics 12. Topics of modern physics of interest to engineers: relativity, atomic structure and spectra, solid state and nuclear physics.

125, 126. *Modern Physics.* I, II. 3 hr. PR: Physics 12. Aspects of modern physics of interest to physicists and engineers. Relativity, atomic structure and spectra, solid state and nuclear physics.

201, 202. *Special Topics.* I, II. 1-3 hr. per sem. PR: Consent. Directed or independent study of topics of current interest in physics.

213. *Electronics.* I, II. 3 hr. PR: Physics 12. Theory, experiments and application of electronics; with laboratory.

225. *Atomic Physics.* I, II. 3 hr. per sem. PR: Physics 251 or equiv. Relativistic mechanics, atomic structure, and spectra.

231, 232. *Theoretical Mechanics.* I, II. 3 hr. per sem. PR: Calculus, Physics 11, 12 or equiv. Scalar and vector fields, curvilinear coordinate systems, kinematics of particle motion. Systems of particles, rigid body motion, central force fields, Lagrangian and Hamiltonian methods, oscillations.

233, 234. *Electricity, Magnetism, and Radiation Optics.* I, II. 3 hr. per sem. PR: Calculus, Physics 11, 12 or equiv. Electrostatics, magnetostatics, introduction to electrodynamics, and applications.

241, 242. *Advanced Physics Laboratory.* I, II. 1-3 hr. per sem. Experiments in physics designed to implement theory courses, give experience in data taking and instrumentation, and learn methods of data evaluation and error analysis.

247, 248. *Physics Seminar.* I, II. No credit. Suggested for junior, senior, and graduate physics majors. These lectures acquaint students with topics of current interest in physics.

251. *Introductory Quantum Mechanics.* I. 3 hr. PR: Physics 225 (or 231, 232). Physical observables as operators. Operator equations, particularly the Schrodinger equation. Applications to one-dimension motion, the harmonic oscillator, atomic structure and spin. Equation of motion.

252. *Introductory Quantum Mechanics.* II. 3 hr. PR: Physics 251. Approximate methods of calculation. Theory of scattering, radiation. Applications to atomic, molecular, nuclear, and solid state physics.

263. *Nuclear Physics.* I, II. 3 hr. PR: Physics 11, 12 or equiv. Physics 225. Study of characteristic properties of nuclei and their structure as inferred from nuclear decays and reactions, leading to a knowledge of nuclear forces and models.

271, 272. *Solid State Physics.* I, II. 3 hr. PR: Physics 225, or 125, 126. Properties of crystalline solids: includes crystal structure, binding, lattice vibrations and an investigation of thermal, electrical, magnetic, and optical phenomena based on energy band theory.

283. *Thermodynamics.* I, II. 3 hr. PR: Calculus, Physics 11, 12 or equiv. Application of the fundamental laws of thermodynamics to physical and chemical systems.

284. *Kinetic Theory.* II. 3 hr. PR: Calculus, Physics 11, 12 or equiv. The concepts of probability which lead to the derivation of the Boltzman, Fermi-Dirac, and Bose-Einstein statistics. Application of these statistics to physical and chemical systems.

301. *Special Topics.* I, II. 1-6 hr. per sem. PR: Consent. Primarily for graduate students. Specialized topics of current interest in physics.

309. *Special Relativity.* I, II. 3 hr. per sem. PR: Calculus, Physics 231 or 233, consent. In-depth study of special relativity emphasizing its logic and paradoxes with applications; its relations to electromagnetism and general relativity.

313. *Introductory Electronics.* S. 3 hr. PR: 1 year college physics. Primarily for education majors; not for graduate credit for science majors.

318. *Air Pollution Meteorology.* II. 3 hr. PR: 1 year college physics, calculus. Primarily for students in engineering (air pollution). Summary of descriptive and dynamic meteorology relevant to air pollution. Disposal of pollutants from a point source. Special topics of current or particular interest.

321. *Optics.* I, II. 3 hr. PR: Calculus, Physics 11, 12 or equiv. A basic course in physical optics covering radiation theory, diffraction, interference, polychromatic waves, scattering, polarization, double refraction, and selected topics in quantum optics.

331, 332. *Advanced Classical Mechanics.* I, II. 3 hr. PR: Physics 233, 234, and differential equations. Lagrange and Hamilton form of equations of motion, rigid bodies, small and nonlinear oscillations. Tranformation theory, relativistic dynamics, and systems with an infinite number of degrees of freedom.

333, 334. *Advanced Electricity and Magnetism.* I, II. 3 hr. PR: Physics 233, 234, and differential equations. Electrostatic and magnetostatic boundary value problems. Maxwell's equations for time varying fields. Green's functions and integral representations; applications to radiation, diffraction, wave guides, plasma physics, and relativistic motion of charged particles.

351, 352. *Quantum Mechanics.* I, II. 3 hr. per sem. PR: Physics 225, 251. This course covers a wide range of topics of current interest at a level such that a student should be able to read basic research papers in many fields upon completion. Topics covered are: approximation methods, representation theory, angular momentum relativistic quantum mechanics, time dependent perturbation theory, identical particles, scattering, molecules, solids, magnetism, and second quantization of bosons and fermions.

354. *Outline of Modern Physics.* S. 3 hr. PR: 10 hr. college physics, 1 year college math. Primarily for education majors; not open to physics majors. Techniques of apparatus construction and demonstration.

355, 356. *Workshop for Physics Teachers.* SI, SII. 3 hr. per sem. PR: 1 year college physics, 1 year college math. Primarily for education majors; not open to physics majors. Techniques of apparatus construction and demonstration.

357. *Photography.* SI. 3 hr. PR: 1 year college physics or equiv. Primarily for education majors; not open to physics majors. The physics and chemistry of photography with practical experience. ($10.00 lab fee.)

358. *Light.* SII. 3 hr. PR: 1 year college physics or equiv. Primarily for education majors; not open to physics majors. A demonstration course designed to illustrate the basic concepts covering light and optics.

361, 362. *Molecular Physics.* I, II. 3 hr. per sem. PR: Physics 225. A presentation of the theory of molecular structure and spectra.

383. *Statistical Mechanics.* II. 3 hr. PR: Physics 283, 351, 352. Classical statistics; Boltzman, Fermi-Dirac and Bose-Einstein statistics, theory of fluctuations and applications to physical systems.

387, 388. *Introduction to Mathematical Physics.* I, II. 3 hr. per sem. PR: Calculus, Differential Equations, Physics 11, 12 or equiv. Complex variables, differential equations, special functions, Fourier Series, Fourier and LaPlace transforms, Green's functions, theory of distributions, vector spaces, variational methods, equations of propagation, perturbation methods, tensor analysis.

Courses of Instruction in Astronomy

Physics

Upper Division

106. *Descriptive Astronomy.* I, II. 3 hr. A discussion of the celestial sphere, star time, solar time, Kepler's laws, H-R diagram and modern developments. No mathematics used; only simple geometrical arguments employed.

216. *Introductory Astronomy for Teachers.* S. 3 hr. Introduction to astronomy with special emphasis on the needs of physical science teachers and science club directors. Not open to students with credit for Physics 106.

255. *Mathematical Astronomy.* II. 3 hr. PR: Physics 106, Math. 16. Development of the implications of Kepler's Laws and Newton's Law of Gravitation.

267. *Basic Astrophysics.* I, II. 3 hr. PR: Physics 124 or equiv. Radiation theory, the Boltzmann and Soha equations, and the several equations of state, the H-R diagram and the interpretation of normal stellar spectra. Physical processes in nebulae.

268. *Galactic Dynamics.* I, II. 3 hr. PR: Calculus. The kinematics and dynamics of the galaxy. Methods for determining the rotation parameters of the Milky Way galaxy from radial velocities and proper motions. Determination of stellar parallaxes, masses, and radii.

359. *Astronomy for Teachers.* S. 3 hr. PR: Consent. Basic concepts and methods in astronomy and how to teach them using the celestial sphere and geometrical tools. Observational work at night. The use of a telescope and camera.

Political Science

Faculty

David G. Temple, Ph.D. (U. Va.), *Chairperson and Professor.*
Orrin B. Conaway, Jr., Ph.D. (Syracuse U.), *Benedum Professor.*
Robert A. DeLapp, Ph.D. (MIT), *Assistant Professor.*
Robert E. DiClerico, Ph.D. (Ind. U.), *Instructor.*
Carl M. Frasure, Ph.D. (Ohio St. U.), *Professor Emeritus.*
Ralph F. Garn, Ph.D. (U. Tenn.), *Assistant Professor.*
Royal C. Gilkey, Ph.D. (U. Minn.), *Professor.*
Allan S. Hammock, Ph.D. (U. Va.), *Associate Professor.*
Robert W. Hoyer, Ph.D. (VPI), *Assistant Professor.*
John A. Jacobsohn, Ph.D. (U. Md.), *Assistant Professor.*
Hong N. Kim, Ph.D. (Georgetown U.), *Associate Professor.*
H. Peter Marshall, M.S. (Mich. St. U.), *Assistant Professor.*

Donald C. Menzel, Jr., Ph.D. (Penn St. U.), *Assistant Professor.*
Herman Mertins, Jr., Ph.D. (Syracuse U.), *Professor.*
Sophia L. Peterson, Ph.D. (UCLA), *Associate Professor.*
Gerald Pops, Ph.D. (Syracuse U.), *Associate Professor.*
George W. Rice, Ph.D. (Ohio St. U.), *Associate Professor.*
William R. Ross, A.M. (WVU), *Associate Professor.*
Harold J. Shamberger, M.P.A. (Wayne St. U.), *Assistant Professor.*
Irvin Stewart, Ph.D. (Columbia U.), *President Emeritus of West Virginia University.*
James B. Whisker, Ph.D. (U. Md.), *Associate Professor.*
Herbert G. Wilcox, Ph.D. (New York U.), *Associate Professor.*
David G. Williams, Ph.D. (SUNY, Albany), *Associate Professor.*
John R. Williams, Ph.D. (Duke U.), *Professor.*
Rodger D. Yeager, Ph.D. (Syracuse U.), *Associate Professor.*

Program

The political science curriculum provides a systematized course of study of the nature and operation of government and politics in its many and varied aspects. These include: principles, organization, and structure of political institutions, both domestic and foreign; the processes and functions of government; interrelationships between political institutions on various levels of government; political behavior; policy development; popular control of government and analysis of public problems falling within the range of government. Course offerings in the Department of Political Science provide a basic general knowledge of the field of politics and administration as well as more extensive and intensive training in the specialized areas of political science, particularly in the senior and graduate levels.

Primary departmental objectives may be classified under four principal headings:

1. To develop an understanding of the nature and role of government in modern society, thus contributing to a general, liberal education.
2. To impart a basic knowledge and understanding of the techniques and processes of government and administration to those persons interested in a career in the public service.
3. To provide pre-professional training for students who are preparing to engage in graduate study or enter the legal profession.
4. To provide advanced and specialized instruction, through the Ph.D. degree, for persons who wish to enter teaching or research in political science.

The political science curriculum, therefore, enables the major in this field to gain an understanding of the political environment in which he lives and also to plan his academic program so as to prepare himself for a career of public service.

Major in Political Science

Hours

Undergraduate majors in political science are required to take at least 27 hours of upper-division course work in the department. There must be a minor consisting of 12 hours of upper-division courses, in history, philosophy, sociology, psychology, English, geography, business and economics, statistics, and computer science. A total of 45 upper-division hours is a requirement.

Required Courses

Each undergraduate major is required to take Pol. Sci. 1 (3 hr.) or 2 (3 hr.). Departmental majors are encouraged to take both Pol. Sci. 1 and 2. Departmental majors must take Econ. 51 and 52 and at least one course from two of the three following areas: psychology, sociology, geography. Six semester hours of history also are required.

Distribution of Courses

The major in political science must work out his program in such a way as to secure a well-rounded knowledge of the field, as well as to concentrate in some particular area. Although the 27 hours of upper-division work in political science is the minimum requirement, students should take at least 33 hours.

The following are distribution requirements for an undergraduate major in political science:

1. At least one upper-division course in political science in each of the six groups into which the offerings of the department are divided.
2. At least three upper-division courses in political science in some one group.

Groupings of Upper-Division Courses by Fields

I. American National, State and Local Government
Pol. Sci. 111, 113, 120, 121, 211, 213, 214, 215, 216, 225, 226, 310.

II. Politics and Policy Development
Pol. Sci. 130, 231, 232, 233, 234.

II. Public Administration
Pol. Sci. 140, 218, 244, 246, 341, 343, 345.

IV. Foreign and Comparative Government
Pol. Sci. 150, 251, 252, 253, 254, 255, 256, 257, 258, 259, 290, 295, 350, 391, 394.

V. International Relations, Organizations, and Law
Pol. Sci. 160, 261, 263, 264, 265, 266, 267, 268, 269.

VI. Political Theory
Pol. Sci. 270, 271, 272, 275, 373, 374.

Honors Program

The Department of Political Science, in cooperation with the Honors Program of the College of Arts and Sciences, offers courses which are opened exclusively to Honors Students. These courses include: Pol. Sci. 1, Elements of Democratic Government, and Pol. Sci. 2, The American Federal System. Students who meet the standards of the Honors Program may enroll in either or both of these courses.

In addition, the Department of Political Science offers Honors courses for those who wish to gain departmental honors status. These include: Pol. Sci. 188, Honors Seminar; Pol. Sci. 189, Selected Topics (Honors); and Pol. Sci. 299, Internship. Students wishing to enroll in the departmental Honors program should contact the Honors Adviser, Department of Political Science.

Courses of Instruction in Political Science

Pol. Sci.

Lower Division

1. *Elements of Democratic Government.* I, II. 3 hr. Primarily for freshmen. Introduction to government. Origin, forms, and functions of the state; organization and forms of government; and the relations of groups and individuals to the state.

2. *The American Federal System.* I, II. 3 hr. Intended primarily for freshmen and sophomores. Survey course in American national government and politics.

Upper Division

101. *Introduction to Government.* I, II. 3 hr. Exclusively for students in the College of Agriculture and Forestry and the College of Engineering. Consideration of the basic principles and operation of national, state, and local government in the United States.

111. *Functions of American National Government.* I, II. 3 hr. The executive branch of government, particularly as its activities relate to social and economic development; expansion of government activities and services since 1932.

113. *American Constitutional Principles.* I. 3 hr. United States Constitution as interpreted by the Supreme Court. Treatment is analytical rather than historical. Text supplemented by some leading cases.

120. *State and Local Government.* I, II. 3 hr. The legal basis, structure, politics and operation of state and local governments, their relations with each other, and their place in the federal system.

121. *Introduction to Urban Planning.* I, II. 3 hr. Structure of urban communities; history, processes, and objectives of planning; trends in planning and urban development.

130. *Political Parties and Electoral Processes.* I, II. 3 hr. Nature of political parties. Public regulation of parties and electoral processes. A close examination of suffrage, nominating devices, campaign procedures, and the conduct of elections.

140. *Introduction to Public Administration.* I, II. 3 hr. The development, organization, procedures, processes, and human relation factors of governmental administration in American democracy.

150. *Contemporary European Governments.* I, II. 3 hr. Comparative analysis of consitutions, political structures, and functions, with major emphasis upon the United Kingdom, France, Russia, and West Germany.

160. *International Relations.* I, II. 3 hr. Contemporary world politics. Background to make present-day international affairs more understandable.

188. *Honors Seminar.* I, II. 3 hr. PR: At least 12 hr. upper-division work in political science, recommendation of adviser, consent. For superior junior and senior political science majors; may be taken more than once.

189. *Selected Topics (Honors).* I, II. 3 hr. PR: Pol. Sci. 188, or at least 15 hr. upper-division work in political science, recommendation of adviser, consent. Designed for superior junior and senior majors in political science; will permit independent research and reading. May be taken more than once.

200. *Research Materials and Techniques in Political Science.* I. 3 hr. Introduction to the techniques and methods of research in political science with particular emphasis upon political behavior.

211. *Problems of American National Government.* II. 3 hr. Course gives recognition to the major contemporary problems of government. Extensive reading of background materials, as well as current literature.

213. *American Constitutional Law.* I. 3 hr. PR: Pol. Sci. 2 or consent. Primarily for seniors and graduate students. Basic principles of American constitutional law as devel-

oped through interpretation with special emphasis on constitutional theories and national development.

214. *Civil Rights and Liberties in the United States.* II. 3 hr. PR: Pol. Sci. 213 or consent. The scope and meaning of civil liberty guarantees in the United States Constitution, as illustrated by cases involving original constitutional provisions, the Bill of Rights, and Civil War amendments with special attention to the rule of law; free speech, press, religion, assembly, and petition; personal security; racial discrimination; and the labor problem.

215. *American Constitutional Development I.* I. 3 hr. PR: Pol. Sci. 2 or consent. American constitutional development, with special emphasis on origins of constitutionalism here; liberty vs. government; mixed government; separation of powers; problem of federalism and Philadelphia Convention of 1781; Marshall court and establishment of judicial review; Federalist vs. States Rights construction of Constitution; Jacksonian influences; Taney Court prelude to Civil War, secession, and conflict, heralding constitutional change.

216. *American Constitutional Development II.* II. 3 hr. PR: Pol. Sci. 2, 215, or consent. American constitutional development, with special attention to reconstruction, Supreme Court, and Fourteenth Amendment; *laissez-faire* and commerce clause; stirrings of reform toward a constitutional revolution under New Deal; changing federal-state relationships; impact of war on constitutional interpretation; expanding role for the president in domestic matters and foreign relations; the Warren Court.

221. *West Virginia Government and Administration.* I, II. 3 hr. Organization and operation of the state government of West Virginia.

225. *Municipal Government.* I. 3 hr. Legal basis, structure, processes and politics of urban governments and cooperative-conflict relations with other governmental units.

226. *Problems of State and Local Government.* II. 3 hr. PR: Pol. Sci. 120 or equiv. Examination of current problems of state, county, and municipal governments.

231. *History of Political Parties.* I. 3 hr. Growth of political parties in the United States. Analysis of issues in presidential campaigns as they relate to political party development.

232. *Public Opinion and Propaganda.* II. 3 hr. Techniques of sampling and measuring public opinion; detection of propaganda; nature of propaganda and methods of the propagandist.

233. *Current Political Issues.* I. 3 hr. Political party platforms and the major issues of the political campaign.

234. *The Legislative Process.* II. 3 hr. Structure and organization of legislative bodies. Powers of legislature. Detailed study of law-making procedures. Influence of outside forces.

240. *Public Administration and Social Change.* II. 3 hr. PR: Pol. Sci. 140.

244. *Administrative Law and Regulation.* II. 3 hr. PR: Pol. Sci. 140 or consent. The law of administration, primarily by case method, covering administrative powers, procedure in administrative adjudication and rule-making, discretion, judicial control and administrative liability.

246. *Comparative Public Administration.* II. 3 hr. Theory and practice of public administration in diverse cultures and national political systems.

251. *Government of the Soviet Union and Eastern Europe.* II. 3 hr. PR: Pol. Sci. 1 or 2.

252. *British Government and Politics.* II. 3 hr. Intensive study of British government with emphasis on internal and external policies, primarily during twentieth century.

253. *Contemporary Governments of the Commonwealth.* II. 3 hr. Analysis of political relationships between members of the Commonwealth. Comparative study of governments and politics of the dominions, with particular reference to Canada and Australia.

254. *Governments of Asia.* I. 3 hr. Survey of political institutions and governmental processes of Japan, China, and India, with a special emphasis on the analysis of contemporary political problems of the governments.

255. *Governments of Latin America.* I. 3 hr. Comparative study of the major nations of Latin America.

256. *Governments of the Middle East.* II. 3 hr. Governments and political forces of the Middle East.

257. *Governments of Southeast Asia.* II. 3 hr. Political institutions and governmental processes of Southeast Asian countries with special emphasis on analysis of contemporary political problems of the governments.

258. *Politics of Africa.* I. 3 hr. The historical legacies and current political processes of tropical African countries. Designed primarily for secondary-level social studies teachers pursuing graduate training.

259. *Political Tour of Europe.* 6 hr. PR: Pol. Sci. 1, 2, or consent. Governments and politics in selected European countries. Lectures and discussions supplement observation while visiting these countries.

261. *International Organization.* I. 3 hr. PR: Pol. Sci. 160 or consent. Agencies created since close of World War II. Some reference to development of international law and United Nations.

263. *Public International Law.* I. 3 hr. Law governing relations among nations, including development of rules, means of enforcement, and conflicts between theory and practice.

264. *Conduct of American Foreign Relations.* I. 3 hr. Basic concepts about and factors influencing the decision-making process and the conduct of United States foreign policy, with special attention to the problems of ends and means of a democracy, pressure interest groups (i.e. the military-industrial complex and the administrative bureaucracy); recent theories, analytical tools, and methodology in the problem areas of conflict-resolution, nonconsensus situations, and inter-nation influence; regional patterns, problems, and prospects of United States policy in Europe, Africa, Asia, and Middle East, and the Soviet bloc since 1945.

265. *Basic Factors in Power Politics.* II. 3 hr. PR: Pol. Sci. 2 or consent. Factors of power in the nation-state system. Evaluation of nationalism and concepts of national interest in modern world politics.

266. *Soviet Foreign Policy.* I. 3 hr. PR: Pol. Sci. 150 or 160 or consent. Basic concepts about and factors influencing choice in the formulation and execution of Soviet foreign policy; development and present patterns in Soviet foreign relations with key states and the United Nations; possible problems and prospects in future Soviet relations.

267. *Latin America in International Affairs.* II. 3 hr. PR: Pol. Sci. 160 or 225 or consent. The relations of Latin American states among themselves, with the United States, with the United Nations, with regional organizations, and with non-western states. Analysis in depth of the Monroe Doctrine and its corollaries, and the inter-American system.

268. *Inter-State Conflict in International Affairs.* II. 3 hr. PR: Pol. Sci. 160 or consent. Conflict in inter-state relations, in particular armed conflict between nations. Attention to the role of force, impact of modern technology and nuclear weaponry, theoretical and research approaches to causes and nature of conflict, and different modes of conflict control and resolution.

269. *Far Eastern International Relations.* II. 3 hr. PR: Pol. Sci. 160 or 254 or 257 or consent. International relations of Far Eastern countries with emphasis on historic roots of recent conflicts, the competitive role of the United States and the Soviet Union, confrontation between the communist and anti-communist countries in the region, and the regional cooperation and security problems in the post-war period.

270. *History of Political Thought: Plato to Machiavelli.* I. 3 hr. Major political ideas from the Greeks to sixteenth century with special emphasis upon development of natural law and western conception of justice.

271. *History of Political Thought: Machiavelli to Bentham.* II. 3 hr. PR: Pol. Sci. 270 or consent. Political ideas which developed from the separation of faith and reason, the culmination of this movement in rational integral liberalism, and the origins of modern conservatism as expounded by Edmund Burke.

272. *Recent and Contemporary Political Thought.* I. 3 hr. Examination of integral liberalism and the forces leading to the decline of liberalism and a critical analysis of the fascist and communist ideologies with their threat to the traditions of western civilization embodied in Christianity and conservatism.

273. *American Political Philosophy.* I. 3 hr. PR: Pol. Sci. 270, 271, 272, or consent.

275. *Foundations of Jurisprudence.* II. 3 hr. Inquiry into: (a) nature, end, and sanctions of law; its sources, forms, and modes of growth, as evidenced in typical legal systems; general juristic conceptions of rights, duties, and liabilities as well as persons, acts, and things; (b) main schools of jurisprudence — analytical, historical, philosophical, sociological, and that of legal realism; (c) economic interpretation of law and its relation to property and interest; (d) problem of legal rule versus discretion; (e) meaning of obligation, with special reference to contract; (f) stages in the development of legal institutions, forms and procedures (as exemplified in trials); (g) significant theories about law; and (h) status of law in today's world.

290. *Socio-Politics of Africa.* I. 3 hr. Political behavior and its social bases in tropical Africa, with particular reference to eastern and central Africa.

295. *The Politics of Planned Development.* II. 3 hr. Political aspects of directed economics and technological change, with special reference to politics of national development planning and development process.

310. *American Political Institutions.* I. 3 hr. PR: Pol. Sci. 2 or consent. Parties, interest groups, the Congress, Presidency, and the Supreme Court as institutions with special attention to current problems, issues, and research in the field.

341. *Administrative Organization and Management.* I. 3 hr. PR: Pol. Sci. 140 or consent. Governmental administrative organization and reorganization and such management functions as leadership, planning, coordination, public relations, and management improvement.

343. *Public Personnel Administration.* II. 3 hr. PR: Pol. Sci. 140 or consent. Public personnel administration with particular attention to the merit system concept, career staffing, classification and salary administration, selection, manpower utilization, training, the rights and duties of employees, and the relationship between management and personnel specialists. Emphasis on psychological and human relations aspects of the work situation with attention to role and status, motivation, leadership, employee relations, and supervisor-subordinate interaction.

345. *Public Administration and Policy Development.* II. 3 hr. PR: Pol. Sci. 140 or consent. Decision-making and policy development in the administrative process by the case method.

350. *Pro-seminar in Comparative Politics.* II. 3 hr.

374. *Problems in Contemporary Political Thought.* II. 3 hr. Current trends in political thought through examination of the works of contemporary writers.

391. *Leadership and Authority in Africa.* II. 3 hr. Traditional, colonial, and contemporary political leadership and authority patterns in Africa south of the Sahara.

394. *Theory of Political Development.* I. 3 hr. Contemporary theories concerning political change and the relationship of political change to economic and technological development with particular reference to the new nations.

Psychology

Faculty

Roger F. Maley, Ph.D. (U. Nebr.), *Acting Chairperson and Associate Professor.*
T. John Akamatsu, Ph.D. (U. Mo.), *Assistant Professor.*
Edward C. Caldwell, Ph.D. (U. Syracuse), *Associate Professor and Associate Chairperson.*
James Capage, Ph.D. (Ohio U.), *Adjunct Assistant Professor.*
James F. Carruth, Ph.D. (U. Ill.), *Professor.*
Norman Cavior, Ph.D. (U. Houston), *Assistant Professor.*
Stanley H. Cohen, Ph.D. (Mich. St. U.), *Assistant Professor.*
Philip E. Comer, Ph.D. (WVU), *Associate Professor.*
John D. Cone, Ph.D. (U. Wash.), *Associate Professor.*
Quin F. Curtis, Ph.D. (U. Mich.), *Professor Emeritus.*
Nancy Datan, Ph.D. (U. Chicago), *Assistant Professor.*
Robert L. Decker, Ph.D. (Carnegie Mellon U.), *Associate Professor.*
Irving J. Goodman, Ph.D. (U. Rochester), *Associate Professor.*
D. Dwight Harshbarger, Ph.D. (U. N. Dak.), *Associate Professor.*
Sharon K. Hunt, Ph.D. (So. Ill. U.), *Visiting Assistant Professor.*
William R. Ives, Ph.D. (Mich. St. U.), *Assistant Professor.*
Vernon Scott Johnson, Ph.D. (Iowa St. U.), *Adjunct Assistant Professor.*
Jon E. Krapfl, Ph.D. (U. Mo.), *Associate Professor.*
Kennon A. Lattal, Ph.D. (U. Ala.), *Assistant Professor.*
Robert W. Miller, Ph.D. (Ohio St. U.), *Professor.*
Joseph Panepinto, Ph.D. (WVU), *Adjunct Assistant Professor.*
B. Kent Parker, Ph.D. (U. Utah), *Assistant Professor.*
Eugene Quarrick, Ph.D. (Syracuse U.), *Associate Professor.*
Hayne W. Reese, Ph.D. (U. Iowa), *Centennial Professor.*
Patricia A. Self, Ph.D. (U. Kans.), *Assistant Professor.*
James N. Shafer, Ph.D. (Ohio St. U.), *Professor.*
Robert G. Summerlin, Ph.D. (Auburn U.), *Adjunct Assistant Professor.*
Ralph R. Turner, Ph.D. (Syracuse U.), *Visiting Assistant Professor.*
Richard T. Walls, Ph.D. (Penn. St. U.), *Adjunct Associate Professor.*

Program

Courses in psychology are designed for one or more of the following ends: (1) as part of a liberal arts education principles, methods and theories are conveyed which are necessary for a better understanding of human and animal behavior; (2) basic preparation for students interested in graduate work leading to a career in basic or applied psychology; (3) preparation for a career as a bachelor's level psychological assistant or technician, or as background for work in related social science fields.

The emphasis of preprofessional undergraduate training in psychology is placed on broad education in the behavioral, biological, physical, and social sciences, and the humanities. Excessive specialization in psychology is discouraged for students who intend to pursue training in psychology at the graduate

level. Such students should rather seek a strong supporting background in mathematics and the natural and social sciences. A strong major, however, is recommended for students who do not intend to continue their education beyond the bachelor's degree.

Major in Psychology

Required Courses

Psych 1, 2;* Stat 101; one course from each of the following groups: (9 hours)

Group I: Psych 121, 122, 124
Group II: Psych 141, 161, 164
Group III: Psych 101, 151

In addition five other 3-hour upper-division psychology courses.

Recommended Electives

Students planning to do graduate work should register during at least one semester in Psych. 213 (Directed Studies) to be involved in some research or directed reading project under individual supervision by a faculty member. Students interested in college teaching would benefit from similar registration to participate in one of the tutorial programs operated in conjunction with Psych. 1, 141, 151, or 164. Students must obtain the instructor's consent before registering for Psych. 213 on a special form obtainable in the department office. Note that no more than 6 hours of Psych. 213 may be counted towards satisfying the major requirement.

Psych. 219 (a one-hour course) is specifically designed for students intending to pursue graduate work in psychology or who wish to work as psychological assistants at the B.A. level. Such students should take this course in the first semester preceding their graduation.

Senior majors holding a 3.0 overall average or better are encouraged to register in selected 300-level courses. They should realize, however, that they will be judged by the same performance criteria as the graduate students for whom such courses are primarily offered. Students must obtain the consent of the individual instructor and of the Graduate School Dean before registering for such courses.

Psychology majors will find the following electives particularly useful:
Biol. 231, 251, 266; Math. 3, 15, 16, 28, 121, 125, 163, 241; Phil. 158; Pol. Sci. 120, 121, 140, 226; Sociol. 51, 71, 101, 121, 122, 132, 133, 135, 154, 201, 205, 231; Stat. 201, 231; Comp. Sci. 1, 101; CDFR 244, 245; S.W. 51, 200, 210.

Courses of Instruction in Psychology

Psych.

Lower Division

1. *Introduction to Psychology.* I, II, S. 3 hr. Survey of general psychology.

*Transfer students may elect to substitute Psych. 122 for Psych. 2. In that case they must then take one additional course from the experimental psychology group.

2. *Introduction to Experimental Psychology.* I, II, S. 3 hr. PR: Psych. 1. Lectures, demonstration, and laboratory exercises in sensory processes, perception, learning. ($5.00 lab fee.)

Upper Division

101. *Leadership and Human Relations.* I, II, S. 3 hr. PR: Psych. 1. Leadership training, motivation and morale, human relations, safety, industry, and society.

111. *Statistical Methods in Psychology.* I and II. 0 hr. PR: Psych. 1. Analysis and interpretation of psychological data. Open to psychology and sociology majors who are concurrently enrolled in Stat. 101.

121. *Intermediate Experimental Psychology.* I, II, S. 3 hr. PR: Psych. 2. Principles of experimental method, psychophysics, and sensory processes surveyed at intermediate level.

122. *Introduction to Conditioning and Learning.* I, II, S. 3 hr. PR: Psych. 2. Lectures and lab. Principles of learning surveyed at intermediate level. Lab exercises and demonstrations. ($10.00 lab fee.)

124. *Introduction to Human Learning.* I, II, S. 3 hr. PR: Psych. 2. Introduction to principles and processes of human learning with emphasis on social learning theory. Special attention is accorded conditioning imitation learning and language.

141. *Introduction to Human Development.* I, II, S. 3 hr. PR: Psych. 1. Introduction to concepts, theories, and methods of studying human development throughout the entire life cycle. Individual projects required.

151. *Introduction to Social Psychology.* I, II, S. 3 hr. PR: Psych. 1. Social factors which determine human behavior. Relationship of class, race, culture, social structure, and other group phenomena to individual behavior. Other topics include: attitudes, public opinion, propaganda, mass media, and national character.

161. *Individual Differences.* I or II. 3 hr. PR: Psych. 1. Primarily for students of psychology and education. Nature and extent of differences among individuals in such traits as intelligence, achievement, personality, and interests as affected by hereditary and environmental differences and by such variables as schooling, socio-economic status, sex, age, and race.

164. *Personal and Social Adjustment.* I, II, S. 3 hr. PR: Psych. 1. Not open for credit to students who have completed Psych. 264. Applications of material from personality, abnormal, clinical, and social psychology to the problems of achieving positive personality change.

201. *Personnel Psychology.* I or II. 3 hr. PR: Psych. 1, Stat. 101, or equiv. Application of psychological principles and techniques to the problems of measurement and prediction of proficiency in industry and society.

213. *Directed Studies.* I, II, S. 1-3 hr. per sem. PR: Consent. Individually supervised reading, research and/or classroom management projects. No more than 6 hr. may be applied to major requirements.

218. *History of Psychology.* I or II. 3 hr. PR: 9 hr. psychology or graduate standing. The development of the science and concepts of psychology from their origin in philosophy, physiology, and medicine up to modern era.

219. *Survey of Psychology.* I. 1 hr. PR: Senior standing. Of primary interest to psychology majors and/or graduate students in other fields who are considering graduate work in psychology. Overview of modern psychology with special reference to problems of graduate and professional training.

223. *Learning and Thinking.* I, II, S. 3 hr. PR: 9 hr. psychology or graduate standing. Not open to students who have credit for Psych. 123. Introduction to complex human behavior with emphasis upon processes underlying learning and cognition. Special

attention to mechanisms of memory, language, verbal behavior, and conceptual processes.

232. *Physiological Psychology.* I or II. 3 hr. PR: 9 hr. psychology or graduate standing. Introduction to physiological mechanisms and the neural basis of behavior. (Also listed as Biol. 232).

242. *Infant Behavior.* I or II. 3 hr. PR: 9 hr. psychology including Psych. 141 or CDFR 141, 142, or graduate standing. Systematic investigation of basic areas of human development during the first years of life. Infant motor development, conditioning and learning, language development, sensory and motor processes.

243. *Child Behavior.* I or II. 3 hr. PR: 9 hr. psychology including Psych. 141 or CDFR 141, 142, or graduate standing. Examination of the literature in experimental child psychology including growth trends in behavior in the physical, intellectual, emotional, social and personality areas.

244. *Adolescent Behavior.* I or II. 3 hr. PR: 9 hr. psychology including Psych. 141 or CDFR 141, 142, or graduate standing. Psychosexual, psychosocial, and other focal problems of development during adolescence are stressed. Cultural influences such as compulsory education, social movements, delinquency, sex roles, and drug abuse are discussed in the context of adolescent development.

245. *Adult Behavior.* I or II. 3 hr. PR: 9 hr. psychology including Psych. 141 or CDFR 141, 142, or graduate standing. Cognitive and personality changes from maturity to old age. Psychological reactions to physiological change and to the establishment and dissolution of family units. Problems of intergenerational differences in adult behavior.

253. *Attitudes and Social Change.* I. 3 hr. PR: 9 hr. psychology including Psych. 151. Nature of attitudes and opinions, attitude measurement, opinion changing, propaganda use and analysis, social psychology of mass media, democratic values, and public opinion. Of interest to students in psychology, sociology, political science, and journalism.

262. *Introduction to Clinical Assessments.* I. 3 hr. PR: Stat. 101, consent. Theory underlying the construction and use of psychometric measurement techniques for evaluating aptitudes, interests, attitudes and personality.

263. *Introduction to Personality.* I, II, S. 3 hr. PR: 9 hr. psychology or graduate standing. Development and significance of the personality concept in psychology including a survey of the major theories such as psychoanalytic, interpersonal, trait, and learning.

264. *Psychology of Adjustment.* I, II, S. 3 hr. PR: 9 hr. psychology or graduate standing. Dynamic principles of human personality adjustment. Primarily for non-majors.

271. *Introduction to Clinical Psychology.* I or II. 3 hr. PR: 9 hr. psychology or graduate standing. Of interest to advanced undergraduates and graduates in education, guidance, personnel, pre-medicine and social work, as well as professionally-oriented students in psychology. Review of concepts, techniques, and professional roles in clinical psychology.

274. *Introduction to Behavior Modification.* 3 hr. PR: 9 hr. psychology including Psych. 122 or 124 or graduate standing. Behavior therapy and modification including desensitization, covert sensitization, interpersonal skill training; aversion techniques and applied behavior analysis employing operant principles.

276. *Group Methods of Behavior Change.* 3 hr. PR: 9 hr. psychology or graduate standing. Group approaches to treatment and enrichment of human behavior. Focus on interpersonal behavior.

279. *Community Psychology.* 3 hr. PR: 9 hr. psychology, including Psych. 151 or graduate standing. Psychological principles applied to treatment and intervention strategies at the community level. Manpower development, organizational change, and systems analysis.

281. *Abnormal Psychology.* I and II. 3 hr. PR: 9 hr. psychology or graduate standing. Major behavioral disorders — neurosis, psychosis, and character disorders. Emphasis on developmental dynamics leading to these disorders, and on their psychological treatment.

282. *Exceptional Children.* I or II. 3 hr. PR: 9 hr. psychology including Psych. 141, or CDFR 141 or 142, or graduate standing. Study of children who present psychological problems: (1) exceptional mental retardation or advancement; (2) organic disabilities having behavioral consequences, such as cerebral palsy or deafness; (3) disorders of conduct associated with a typical personality functioning.

304. *Leadership and Human Relations in Working Groups.* I or II. 1-3 hr. PR: Consent. Individual work related to either research or practice in the field of human relations training programs.

307. *Practicum in Industrial Interviewing.* I or II. 3 hr. PR: Psych. 201 or consent. Intensive review of principles of selection and validation. Practice interviews applying non-directive techniques in employment and other types of interview.

311. *Research Design in Psychology.* I. 3 hr. PR: Elementary statistics and consent. For majors only. Issues and elements of empirical inquiry, quantification of concepts, manipulation, controls and confounds, examination of exemplary research designs in specific content areas of psychology.

312. *Data Analysis in Psychology.* II. 3 hr. PR: Psych. 311 or consent. For majors only. Inferential statistics, analysis of variance, simple correlation and regression, special topics in data analysis in psychology.

313. *Directed Study.* I, II, S. 1-3 hr. per sem. PR: Consent. Directed reading and research in special areas. (Undergraduates register for such projects under Psych. 213.)

314. *Theory of Tests and Measurement.* I. 3 hr. PR: Elementary statistics and consent. Theory underlying psychological scaling, mathematical models, classical psychometrics. Introduction to concepts of reliability, validity, correlation and regression, multivariate analysis procedures.

315. *Multivariate Analysis.* I or II. 3 hr. PR: Psych. 311, or 314, or equiv., and consent. Correlational methods in pscyhology with application to typical research problems. Includes simple matrix algebra, multiple correlation, discriminant analysis, and an introduction to factor analysis. (Equiv. to Stat. 341.)

321. *Sensory Processes.* I or II. 3 hr. PR: Psych. 121, or 122, or equiv. Psychophysics of vision and audition are analyzed and related to current theories. Methods of research on sensory processes are reviewed.

322. *Conditioning and Learning.* I or II. 3 hr. PR: Psych. 122, consent. Review of current research in operant and classical conditioning. Controversial issues in learning are reviewed in light of recent research and theories.

323. *Perceptual and Cognitive Processes.* I or II. 3 hr. PR: Psych. 121 or equiv. Consideration of classical and contemporary research and theory on perception and cognitive processes, including concept formation and thinking.

324. *Motivation.* I or II. 3 hr. PR: Psych. 121, or 122, or equiv. Survey of experimental data and theory in the area of motivation as it relates to learning and personality.

331. *Physiological Psychology.* I or II. 3 hr. PR: Psych. 121, 122, Biol. 266 or equiv. Biological bases for psychological activities such as perception, emotion, motivation, and learning. (Equiv. to Biol. 331.)

338. *Seminar in Animal Behavior.* I or II. 2 hr. per sem. PR: Consent. Current research and problems in animal behavior. (Equiv. to Biol. 338).

340. *Advanced Developmental Psychology.* I or II. 3 hr. PR: Psych. 141, 314, or equiv. and consent. Research methods and substantive findings in the psychology of human development from birth to death, emphasizing developmental processes over the entire life-span.

347. *Comparative Psychology.* I or II. 3 hr. PR: Biol. 266, Psych. 121 or 122. Comparison of the structure of representative animals of the various phyla in relation to differences in behavior.

351. *Advanced Social Psychology.* I or II. 3 hr. PR: Psych. 151, consent. Consideration of contemporary theory and practice in social psychology.

355. *Behavioral Science and Health Care.* II. 3 hr. PR: Consent. Principles of behavioral science applied to issues in physical and mental health care. Topics include the study of interpersonal roles and games, various cultural "healing" practices, personal and social aspects of illness, family disorganization, and hospitals and related institutions. (Equiv. to Behav. Med. & Psychiatry 355.)

363. *Personality Theory and Research.* I or II. 3 hr. PR: Psych. 263, 314, or equiv. Intensive analysis of current research and theory in the psychology of personality.

379. *Professional Problems in the Practice of Psychology.* I or II. 2 hr. PR: Consent. Current problems in the practice of clinical psychology.

381. *Behavior Pathology.* I or II. 3 hr. PR: Psych. 263, 281, consent. Advanced study of etiology and dynamics of severe behavior pathology.

Religious Studies

Faculty

Manfred O. Meitzen, Ph.D. (Harvard U.), *Chairperson and Professor of Religious Studies.*
Alan W. Jenks, Th.D. (Harvard U.), *Associate Professor of Religious Studies.*
Ottomar F. Cypris, Th.D. (Union Theol. Sem.), *Assistant Professor of Religious Studies.*

Religious studies courses provide instruction in the field of man's experience concerning God, the transcendent, and ultimate concern. Such studies include both the intellectual activity of man about this experience (theology) as well as man's resultant deeds in worship and ritual, ethics, and history. Part of the curriculum is devoted to the study of the world's great scriptures. Another part deals with the history of religions. Another segment deals with contemporary religious thought. Another part probes into the interrelation of theology and culture. Throughout the religious studies program, attention is given to the relevance of the subject matter to the lives of the students at the time in which they are living. While religious studies offers no major, courses in religious studies may be taken for Core Curriculum credit, as well as elective credit, and are meant for the enrichment of the global, liberal arts education of the student.

Courses of Instruction in Religious Studies

Religious Studies

5. *An Introduction to Issues in Religious Studies.* I. 3 hr. (For freshmen only.) Leading issues involved in religious studies: transcendence, the God question, evil, redemption, community, eschatology, symbolism, ethics, examples of relationship between religion and culture.

50. *Honors Course in Religious Studies.* I or II. 3 hr. Open only to honors students. A basic theological topic, which is suitable for study by an undergraduate honors class, will be selected for each semester.

100. *Introduction to the Gospels.* I. 3 hr. The four Gospels of the New Testament, involving a brief introduction to the literature and historical setting of the Gospels with an intensive study of the Christ event. Discusses a number of basic theological issues; and it constantly relates Scripture teachings to contemporary situation.

101. *A Study of Paul.* II. 3 hr. Introduction to the life and theology of Paul, involving a study of the letters of Paul and other pertinent early Christian literature. Discusses a number of basic theological issues; and constantly relates the Scriptures teachings to contemporary situation.

102, 103. *Introduction to the Old Testament.* I, II. 3 hr. per sem. A brief introduction to Old Testament literature, its historical background, its great personalities, and the development of beliefs and customs of importance both to Jews and to Christians. The development of Israel and her theology will be traced up to the eighth century B.C. The course discusses a number of basic theological issues; and it constantly relates the teaching of the Scriptures to the contemporary situation.

110. *Problems in Contemporary Judaeo-Christian Thinking.* I. 3 hr. PR: A previous religious studies course or consent. Problems treated include: function of reason in Judaeo-Christian faith and relationship of reason and revelation to each other; Judaeo-Christian understanding of history; a selected topic.

111. *Problems in Contemporary Judaeo-Christian Thinking.* II. 3 hr. PR: A previous religious studies course or consent. Problems treated include: ecumenical movement within Church; the Spirit; recent transformations in ethical and social thinking (new morality); secular theology (new theology).

112. *Judaeo-Christian Teachings About the Problems of Man.* I. 3 hr. PR: A previous religious studies course or consent. The dialog between the existential problems of man, e.g., anxiety, loneliness, meaninglessness, guilt, death, lust, wrath, and others, and response of Judaeo-Christian faith. Introduction to existential theology.

120, 121. *History of Christian Thought.* I, II. 3 hr. per sem. A study of significant men and movements of thought among the Christians and the way in which these contributed to answering the perennial questions of religion from a Christian perspective. Religious Studies 120 covers the history of Christian thought to 1500; 121 from 1500 to the present time.

123. *Roman Catholic Thought From the Council of Trent to Vatican Council II.* II. 3 hr. PR: A previous religious studies course or consent. Roman Catholic thinkers and movements in doctrinal, biblical, historical, and social thought; reform and renewal movement of Vatican Council II; role of Roman Catholicism in contemporary society.

124. *Christian Thought in the Reformation Era.* I or II. 3 hr. PR: A previous religious studies course or consent. The significant men and movements in the four primary streams of sixteenth century Christian thought in western Europe: Protestantism, radical Christianity, Roman Catholicism, and Anglicanism.

126. *Early Medieval Theology and Culture.* I. 3 hr. PR: A previous religious studies course or consent. The primary ways which early medieval Christian thought responded to the cultural heritage of the West. The rise of the medieval synthesis of theology and culture.

128. *History of American Religion: 1607-1820.* I. 3 hr. PR: A previous religious studies course or consent. The origins, growth, and influence of major religious ideas and movements which were significant in shaping religious life of the American people in colonial and early federal periods.

129. *History of American Religion: 1820 to Date.* II. 3 hr. PR: A previous religious studies course or consent. The origins, growth, and influence of major religious ideas and movements which have been significant in shaping of religious life of the American people since 1820.

130. *World Religions: Religions of India.* I. 3 hr. Proto-Indian religion, Hinduism, beginnings of Buddhism, Jainism, Sikhism; historical and theological foundations; developments of thought; contemporary expressions and encounter with modern world.

131. *World Religions: Religions of China and Japan.* II. 3 hr. Buddhism, Confucianism, Taoism, Shinto; historical and theological foundations, developments of thought; contemporary expressions and encounters with modern world.

140. *Theology and Culture.* I. 3 hr. PR: A previous religious studies course or consent. An interdisciplinary course involving members of various parts of the faculty of WVU in dialog with a professor of religious studies. The dialog will be carried on with the humanities and the arts.

141. *Theology and Culture.* II. 3 hr. PR: A previous religious studies course or consent. An interdisciplinary course involving members of various parts of the faculty of WVU in dialog with a professor of religious studies. The dialog will be carried on with science and technology.

290. *Seminar: Selected Topic.* 3 hr. PR: A previous religious studies course or consent.

291. *Seminar: Selected Topic.* 3 hr. PR: A previous religious studies course or consent.

Social Science

Soc. Sci.

1, 2. *Introductory General Course.* I, II. 3 hr. per sem. This interdisciplinary course aids the student in preparation for citizenship by advancing the student's understanding of the social order. The heart of the course is an analysis of selected critical and social issues. Guest lecturers, films, and discussion groups.

191. *Special Topics.* I, II. 1-6 hr. PR: Consent.

Sociology and Anthropology

Faculty

Arnold J. Levine, Ph.D. (Columbia U.), *Chairperson and Professor.*
Ronald C. Althouse, Ph.D. (U. Minn.), *Associate Professor.*
Richard A. Ball, Ph.D. (Ohio St. U.), *Associate Professor.*
H. Russell Bernard, Ph.D. (U. Ill.), *Associate Professor of Anthropology.*
Bettye J. Broyles, B.S. (Chattanooga U.), *Instructor (part-time) in Anthropology.*
N. David Crowder, Ph.D. (Duke U.), *Assistant Professor.*
Harold A. Gibbard, Ph.D. (U. Mich.), *Professor and Assistant to Provost — Instruction.*

John T. Griffin, Ph.D. (U. Mo.), *Assistant Professor.*
David S. Hall, Ph.D. (U. Ky.), *Associate Professor.*
Charles D. Hennon, Ph.D. (Case West. Reserve U.), *Assistant Professor.*
Rusi Hilloowala, Ph.D. (U. Ala.), *Adjunct Assistant Professor of Anthropology.*
Harold N. Kerr, Ph.D. (Ohio St. U.), *Professor Emeritus.*
Jiri T. Kolaja, Ph.D. (Cornell U.), *Professor.*
John D. Lozier, Ph.D. (U. Minn.), *Assistant Professor of Anthropology.*
Ann L. Paterson, Ph.D. (Mich. St. U.), *Assistant Professor (part-time).*
John D. Photiadis, Ph.D. (Cornell U.), *Professor.*
Patricia C. Rice, M.A. (Ohio St. U.), *Instructor (part-time) in Anthropology.*
John Schnabel, Ph.D. (U. Notre Dame), *Assistant Professor.*
Joseph J. Simoni, Ph.D. (U. Notre Dame), *Assistant Professor.*
Leonard M. Sizer, Ph.D. (U. Iowa), *Associate Professor.*
Roger Trent, M.A. (U. Wash.), *Assistant Professor.*
Neil J. Weller, Ph.D. (U. Mich.), *Assistant Professor.*

Programs

Sociology and anthropology courses constitute an important part of a general liberal education. They foster an awareness of the structure of human societies and of the social processes which operate in all groups, organizations, and institutions. The student is exposed to the methods of inquiry that sociology and anthropology have in common as well as to special knowledge and insights of the two disciplines. Courses in the department also are intended to facilitate the application of sociological and anthropological principles to the wide range of contemporary social problems. Undergraduate training in the department is particularly relevant for students in psychology, political science, economics, social work, education, communication, and the humanities. Sociology and anthropology also constitute an important part of the undergraduate education for those pursuing a career in law, the health professions, and for engineers and others concerned with environmental and ecological problems. Undergraduate training in sociology and anthropology is relevant to careers in the teaching of the social sciences, applied research with governmental agencies, and community development and planning. Majors also are well equipped for graduate training in sociology or anthropology in pursuit of an academic career in teaching and research.

Students have the option of concentrating in sociology or in anthropology or in a combination of these two fields.

Majors in Sociology and Anthropology

Required Courses

All majors must take at least one of the introductory courses: S.A. 1, 5, or 7, preferably in the freshman year. A major is encouraged to take two of these courses, but should not take all three. All departmental majors must fulfill the following requirements:

1. S.A. 101: This course should be taken as soon as possible after completing the introductory courses.
2. S.A. 201: For the Sociology concentration

   or

   S.A. 255: For the Anthropology concentration

   Students who plan to go to graduate school are encouraged to take both S.A. 201 and 255.

3. S.A. 211.
4. S.A. 256.
5. Stat. 101 or equivalent.

I. Those majors concentrating in Sociology are required to take an additional 24 hours of upper-division courses in this department. With the written permission of the adviser, up to 6 hours of appropriate courses from other departments may be substituted.

II. Those majors concentrating in Anthropology are required to take S.A. 152 and 21 additional upper-division hours in the department. With the written permission of the adviser, up to 6 hours of appropriate courses from other departments may be substituted.

III. A combined Sociology and Anthropology concentration also is possible. For this option, a student is required to take S.A. 101, 152, 201, 211, 255, 256, and Stat. 101. An additional 18 hours of upper-division courses in the department also are required. With the written permission of the adviser, up to 6 hours of appropriate courses from other departments may be substituted.

Courses of Instruction in Sociology and Anthropology

S.A.

Lower Division

1. *Introduction to Sociology.* I, II, S. 3 hr. Basic course intended to develop a perspective about the nature of social processes and structure of society.

5. *Introduction to Anthropology.* I, II, S. 3 hr. Essentials of human evolution and culture history with a consideration of varieties of languages and cultures found among peoples of the world.

7. *Introduction to Social Problems.* I, II. 3 hr. Causes of social disorganization in modern society. Drug and alcohol abuse, mental illness, family conflict, and crime.

Upper Division

101. *Principles of Social Organization.* I, II. 3 hr. PR: S.A. 1, 5, or 7. The major concepts used in the study of society and social life. Emphasis on research findings derived from studies of contemporary American society.

121. *The Family.* I, II. 3 hr. PR: S.A. 1, 5, or 7. Comparative approach to changing structure and functions of the family institution. The effect of economic, demographic, and cultural changes on male-female relationships, sex roles, marriage, and child care.

122. *The Community.* II. 3 hr. PR: S.A. 1, 5, or 7. Social structure of small towns and rural communities. The community power structure and political participation as they relate to community planning.

131. *Urban Sociology.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Ecological, demographic and socio-cultural patterns of cities and their hinterland, including a study of racial and ethnic neighborhoods of inner-city and process of suburbanization.

132. *Criminology.* I, II. 3 hr. PR: S.A. 1, 5 or 7. Exploration of various theories of criminal behavior; emphasis on a critical study of criminal justice system and efforts to reform the penal system.

133. *Juvenile Delinquency.* I, II. 3 hr. PR: S.A. 1, 5, or 7. Nature, extent, and causal explanation of forms of juvenile delinquency. The nature of juvenile courts, the correctional system, and prevention programs.

135. *Race and Ethnic Relations.* I. 3 hr. PR: S.A. 1, 5, or 7. Causes and consequences of prejudice and discriminatory practices involving minority group members. Emphasis on blacks, but social and economic conditions of Chicanos, Indians and other ethnic and religious minorities, also discussed.

136. *Sociology of Religion.* II. 3 hr. PR: S.A. 1, 5, or 7. Relationship of religion and society. Origin of religious institutions, structure, function, and role in change or stability of the social system.

140. *Social Change in Appalachia.* I, II. 3 hr. PR: S.A. 1, 5, or 7. Description of early Appalachian society as a prelude to the understanding of the economic, social, and cultural changes taking place today. The family, church, education, social class, and community structure. Programs of directed intervention, change, and development discussed.

151. *Introduction to Ethnology.* I. 3 hr. PR: S.A. 1, 5, or 7. Descriptive study of peoples and cultures of the world, especially pre-industrial societies.

152. *Introduction to Physical Anthropology.* II. 3 hr. PR: S.A. 1, 5, or 7. Fossil evidence for human evolution, racial variation, and relationship between biology and behavior.

154. *Anthropology of War and Aggression.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Biologically based conceptions of human aggression. Socio-cultural account of human violence and warfare as an instrument for accomplishing goals and a valued form of personal behavior.

155. *Latin American Society and Culture.* I, II, or S. 3 hr. PR: S.A. 1, 5, or 7. Anthropological evidence of what is "Latin" (Spanish) and what is "American" (Indian) about Latin American society and culture today. Emphasis on pre-historic and colonial experience.

156. *African Society and Culture.* I or II. 3 hr. PR: S.A. 1, 5, or 7. The peoples and cultures of Black Africa. Impact of colonialism on the region.

158. *Introduction to Archaeology.* I. 3 hr. Prehistoric cultures of the world and methods used in reconstructing them.

159. *Archaeology of Appalachia.* II. 3 hr. The content, distribution, sequence, and significance of early Appalachian Indian cultures.

201. *Sociological Theory.* I, II. 3 hr. PR: S.A. 1, 5, or 7. Systematic analysis of major sociological theories viewed from historical perspective and in terms of current research.

202. *Behavioral Sociology.* I, II, S. 3 hr. PR: S.A. 1, 5, or 7. Sociological principles and methods in the study of individual and group behavior. Social interaction, power and influence, conformity, attitude change, role behavior, social perception, and socio-linguistics.

203. *Collective Behavior.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Analysis of riots, demonstrations, crowd and mob behavior, and other forms of social contagion, and a study of behaviors following natural disasters and social unrest.

204. *Complex Organizations.* I or II. 3 hr. PR: S.A. 1, 5, or 7. The structure and functioning of large-scale, bureaucratic organizations, including studies of industrial organizations, prisons, hospitals, government bureaus, and the military in contemporary society.

205. *Social Stratification.* I, II. 3 hr. PR: S.A. 1, 5, or 7. Analysis of various systems of social inequality. Emphasis on empirical studies describing social class system, distribution of status and power, and patterns of social mobility in America.

211. *Social Research Methods.* I, II. 3 hr. PR: S.A. 1, 5, or 7. Logic of social research, elements of research design, and problems of measurement, with emphasis on survey research methodology and data analysis.

221. *Sociology of Childhood.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Theory and research on socialization processes in the family, peer group, and community, including comparative study of child-rearing practices among different regions, social classes, and ethnic groups.

222. *Principles of Community Development.* I. 3 hr. PR: S.A. 1, 5, or 7. Application of sociological knowledge of structure of communities for planning programs and services. Emphasis on techniques of organizing efforts for community change.

223. *Sociology of Rural Life.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Social aspects of rural living. Characteristics of rural population, social structure, and institutional arrangements: family, community, education, religion, recreation, health, welfare, and local govenment.

231. *Society and Health.* I. 3 hr. PR: S.A. 1, 5, or 7. Health and illness behavior and the social organization of the health professions, including the problems of health-care delivery systems in the United States and in developing areas.

232. *Sociology of Education.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Education as a social institution, cultural and class influences on education, social roles and career patterns in the school system, the school and problems of the community.

233. *Industrial Sociology.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Cross-cultural studies of work and of the structure and functioning of industrial organizations.

240. *Social Change.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Sociological analysis of current major changes in our society, of the forces underlying them, and of tensions to which they give rise. Alternative future directions; rational manipulation and planning for social change.

241. *Population Dynamics.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Demographic analysis focusing on social causes and consequences of variations in fertility, morbidity, mortality, and migration. National and state population policies also considered.

245. *Soviet Society.* I. 3 hr. PR: S.A. 1, 5, or 7. Social and cultural trends in contemporary Soviet Union. Population characteristics and ethnic and nationality diversity; the family, education, political institutions and social classes; agricultural, industrial, and scientific organization. Comparisons with U.S. society.

250. *Comparative Peasant Societies.* II. 3 hr. PR: S.A. 1, 5, or 7. Economic and social conditions in traditional peasant societies. Materials drawn primarily from Latin America and Mediterranean Europe.

251. *Cultural Dynamics.* I. 3. hr. PR: S.A. 1, 5, or 7. Nature of culture and how it changes, including natural environmental changes, culture-contact, economic and population pressures.

252. *Culture and Personality.* I, II. 3 hr. PR: S.A. 1, 5, or 7. How different cultures shape the personalities of their members; concepts such as modal personality and national character.

253. *Cross-Cultural Studies in Development.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Comparative study of processes of change in societies in early stages of industrialization.

255. *Anthropological Theory.* I. 3 hr. PR: S.A. 1, 5, or 7. Theoretical contributions of anthropology to the social sciences. Key figures of modern anthropology, i.e. Boas, Malinowski, and Mead.

256. *Field Methods in Cultural Anthropology.* II. 3 hr. PR: S.A. 211 or consent. The distinctive craft of data gathering in cultural anthropology. Development skills in field methods and participant observation.

260. *Social Structure and Personality.* I or II. 3 hr. PR: S.A. 1, 5, or 7. Interaction between society and the individual's behavior. Key concepts are social role, and the social self. Focus on adult experiences and adult socialization.

290. *Special Topics.* I, II, S. 3 hr. PR: S.A. 1, 5, or 7. A seminar primarily for department majors on issues and problems of current concern.

291. *Honors Seminar.* I, II. 3 hr. PR: Honors standing in sociology. A seminar on a topic of importance in sociology and anthropology.

293. *Independent Study.* I, II, S. 1-3 hr. per sem. PR: 3.0 grade-point average and written departmental-permission. Directed reading or research for students desiring work not available in regular course offerings.

322. *Contemporary Sociological Theory.* I, II. 3 hr. PR: 9 hr. sociology or consent. Review of recent trends and orientations in sociology. Theory construction, typologies, mathematical models and the relationship between theory and research. Review of current literature.

331. *Methods of Social Research.* I, II. 3 hr. PR: Stat. 101, 311, or equiv. The research process from conceptualization of the problem to analysis of the data. Sampling, questionnaire construction, measurement, and computer skills in analysis of data.

341. *Demographic Methods and Analysis.* I. 3 hr. PR: 9 hr. sociology or consent. The field of human population focusing on fertility, mortality, and migration. Population policy in relation to economic and social development.

342. *Demographic Patterns in West Virginia.* II. 3 hr. Population trends in the state in relation to social and economic conditions. Students work intimately with West Virginia census data and vital statistics.

370. *Group Dynamics.* I or II. 3 hr. PR: 9 hr. sociology or consent. Patterning of interpersonal relationships within natural and experimental groups including such topics as communication, attraction, power, group cohesiveness, and coalition formation.

371. *Sociology of Deviant Behavior.* I. 3 hr. PR: 9 hr. sociology or consent. Various theoretical orientations to the study of deviant behaviors including views of causation and behavioral change. The social definitions, stigma, and labels attached to certain behaviors and the development of deviant "careers."

372. *Sociocultural Factors in Health, Illness, and Medical Care.* I. 3 hr. PR: 9 hr. of sociology or consent. Distribution of disease in the population and patterns of illness behavior. Sociological study of the health professions, community health care institutions, and the cost and organization of health services.

380. *Kinship and Family Structure.* II. 3 hr. PR: 9 hr. of sociology or consent. Cross-cultural perspectives on the family institution. The role of kinship networks and the relationship between the family and social class and occupational position.

Speech Communication

Faculty

James C. McCroskey, Ed.D. (Penn. St. U.), *Professor; Chairperson.*
Michael Burgoon, Ph.D. (Mich. St. U.), *Associate Professor.*
Gregory L. Bowler, Ph.D. (Ohio St. U.), *Assistant Professor.*
Leonard M. Davis, Ph.D. (Northwestern U.), *Professor.*
M. Lucille DeBerry, M.A. (U. Iowa), *Instructor.*
Betty Snyder Hall, M.A. (WVU), *Assistant Professor.*
H. Thomas Hurt, Ph.D. (Ohio U.), *Assistant Professor.*
William B. Lashbrook, Ph.D. (Mich. St. U.), *Professor.*
Enid Portnoy, M.A. (Northwestern U.), *Assistant Professor.*
Walter H. Rockenstein, Ph.D. (Northwestern U.), *Associate Professor.*
Charles Russell, Ph.D. (SIU), *Assistant Professor.*
Michael D. Scott, Ph.D. (U. So. Cal.), *Assistant Professor.*

John Shibley, Ph.D. (Ohio St. U.), *Associate Professor.*
Lloyd W. Welden, Sr., M.A. (U. Mo.), *Professor Emeritus.*
Lawrence Wheeless, Ph.D. (Wayne St. U.), *Assistant Professor.*

Programs

The Department of Speech Communication offers a curriculum designed to meet the needs of liberal arts and preprofessional students. The undergraduate curriculum focuses upon the application of theory and research in human communication to a variety of personal and social settings.

In addition a major and a minor in speech communication are available for students wishing to pursue in-depth study in the field. The major and minor provide: (1) general core of basic theory, research, and application; and, (2) flexibility in electives which allows the major to emphasize course work in a particular area. Emphasis in the major supplies a background useful for those anticipating futures in teaching, organizations and institutions, mass communication, professional schools, or graduate study. (Those students anticipating teaching also must fulfill certification requirements of the State Board of Education.)

Forensic Program. The Department of Speech Communication offers an active forensic program for interested students in the University. The program emphasizes intercollegiate and on-campus debate. Students travel nationwide to debate tournaments and participate in various campus and regional activities. Active participation in forensics normally leads to membership in Delta Sigma Rho-Tau Kappa Alpha, forensic honor society.

Major in Speech Communication

The minimum requirement for a major in speech communication is 36 semester hours of credit (18 hours must be in upper-division courses). A total of 42 hours in speech communication may be counted toward graduation.

Required Courses

The following core of courses is required of all majors: Sp. Com. 11, 111, 133, 160, and 180. Students should choose electives from offerings in the department to complete minimum semester hours of credit required for the major (36 hours).

Recommended Electives

Area Emphases. The following courses are recommended departmental electives for majors wishing to emphasize interpersonal communication: Sp. Com. 106, 107, 131, 221, 231, and 377, plus additional 300-level courses.

The following courses are recommended departmental electives for majors wishing to emphasize mass communication: Sp. Com. 80, 106, 107, 221, 281, and 372.

The following courses are recommended departmental electives for majors wishing to emphasize organizational and institutional communication or who seek a preprofessional background in communication: Sp. Com. 80, 106, 107, 109, 131, 221, 231, and 376.

Majors, especially freshmen and sophomores, should consult the requirements for the A.B. Recommendations for courses and minors that complement a major in speech communication and which fulfill College of Arts and Sciences requirements can be secured by consulting the Academic Advising Center (freshmen and sophomores) or academic advisers in the department (juniors and

seniors). Majors should consult carefully with advisers in planning courses of study.

Recommended Courses in University Core Requirements. The following courses are recommended to majors for fulfilling University Core Curriculum requirements for graduation: (Group A, 12 hr.), Phil. 1, 51, 104, 158, 185; (Group B, 12 hr.), Econ. 51, 241, 245, 262, Pol. Sci. 140, 214, 232, 295, 343, Psych. 1, 2, 101, 121, 122, 123, 151, 253, 262, 263, 311, 314, 351, 352, S.A. 1, 131, 203, 204, 211, 233, 240, 253; (Group C, 12 hr.), Biol. 1, 2, C.S. 1, Geol. 2, 5, Stat. 101, 201, 213, 214, 231, 311, 341.

Recommended Minors and Electives for Speech Communication Majors. Majors in speech communication are advised (not required) to pursue a minor concentration or electives in an area(s) related to their emphasis or interests. Following are recommended for consideration: journalism, business, psychology, sociology and anthropology, philosophy, and political science.

Courses of Instruction in Speech Communication

Sp. Com.

Lower Division

11. *Principles of Human Communication.* I, II, S. 1 hr. Introduction to the human communication process with emphasis on the principles, variables, and social contexts of communication.

12. *Human Communication in the Interpersonal Context.* I, II, S. 2 hr. PR or Conc.: Sp. Com. 11. Introduction to interpersonal communication with emphasis upon application of one-to-one communication in a variety of social contexts.

13. *Human Communication in the Small Group.* I, II, S. 2 hr. PR or Conc.: Sp. Com. 11. Introduction to small group communication with emphasis upon application in a variety of social contexts.

14. *Human Communication in the Public Communication Context.* I, II, S. 2 hr. PR or Conc.: Sp. Com. 11. Introduction to principles of communication in the one-to-many context. Application in public speaking settings. (Credit not counted toward major in speech communication.)

21. *Human Communication in a Contemporary Society.* I, II, S. 3 hr. Introduction to principles of communication and decision making on significant issues in a free society. Emphasis on topics such as freedom of speech and press.

60. *Practicum in Debate.* I, II. 3 hr. (Repeatable). PR: Consent. Experience and training in rational debate with emphasis upon intercollegiate and on-campus debating. (No more than 3 hr. can be counted toward major.)

80. *Introduction to Broadcasting.* I, II, S. 2 hr. Critical examination of mass media with special emphasis on ways in which social, economic, and psychological factors influence the structure, functions, and effects of the media.

81. *Practicum in Mass Communication.* I, II, S. 1 hr. (Repeatable to 4 hr. total.) PR: Sp. Com. 80. Open only to majors and minors in speech communication. Supervised experience in media skills in out-of-class assignments to various production centers.

Upper Division

105. *Special Topics in Human Communication.* I, II, S. 3 hr. PR: Sp. Com. 11 (Repeatable to 6 hr. total.) Topics: Communication and conflict resolution, role of communication in negotiation and bargaining, contemporary communication criticism, issues in communication fields, etc.

106. *Nonverbal Communication.* I, II, S. 3 hr. PR: Sp. Com. 11. Nonverbal messages and codes with attention to communication effects of time, space, kinetics, touch, objects, social contexts, and physical surroundings.

107. *Communication and Rational Decision.* I, II. 3 hr. Argumentation, small group, persuasion, and systems theories application to the process and outcome of rational decision-making in communication. Some emphasis on critical-rational response to manipulative communication.

108. *Nonviolence in Communication Behavior.* I, II. 3 hr. Nonviolent resistance as communication behavior. Emphasis on major proponents of and upon learning ways to apply nonviolence in communication behavior.

109. *Communication in Organizations and Institutions.* I, II, S. 3 hr. PR: Sp. Com. 11. Communication processes and problems in business and nonbusiness organizations and institutions with attention to practical application.

111. *Communication of Social Innovations.* I, II, S. 3 hr. Communication in the societal setting with emphasis on communication of innovations, diffusion of information, and adoption of change.

131. *Human Communication and Language Behavior.* I, II, S. 3 hr. Production and use of language with emphasis on linguistic, psychological, sociological, and developmental perspectives.

133. *Interpersonal Communication.* I, II, S. 3 hr. PR: Sp. Com. 11. Survey of theoretical and research literature in interpersonal communication. Emphasis on interaction, interpersonal understanding, personal relationships, and self understanding as outcomes in interpersonal communication.

160. *Communication Research Methods.* II. 3 hr. PR: Sp. Com. 11, 12 hr. speech communication, or consent. Research methods in human communication with emphasis on experimental procedures, design, analysis, and interpretation.

161. *Directed Studies in Human Communication.* I, II, S. 3 hr. (Repeatable to 6 hr.) PR: Sp. Com. 160 or consent. Communication study and research in special areas of human communication.

175. *Communication of the Black Movement.* I, II. 3 hr. PR: Consent. Critical rhetorical strategies used by blacks and whites related to past and present racial conditions in America. Emphasis on analyzing rhetorical styles and effects of DuBois, Garvey, Garrison, Tubman, King, and Malcom X.

180. *Effects of Mediated Communication.* I, II, S. 3 hr. PR: Sp. Com. 11. Messages and characteristics of mass media with emphasis on effects of mass communication on society.

187. *Appreciation of the Motion Picture.* I, II. 3 hr. Viewing lab. Evaluation of motion picture and television film as art forms, involving aesthetic principles. Various films considered. (Also listed as Journ. 187).

201. *Principles of Communication Education.* I, II, S. 3 hr. PR: 15 hr. speech communication. Literature, principles, and current practices of communication education in public schools with directed application. Intended for teachers in communication and language arts.

202. *Directing the Forensic Program.* II, S. 1-3 hr. PR: Sp. Com. 107. Principles and techniques of administering a forensic program, tournament direction, and conducting extracurricular activities.

221. *Persuasion.* I, II, S. 3 hr. PR: Sp. Com. 11. Theory and research in persuasion, emphasizing a critical understanding and working knowledge of the effects of social communication on attitudes, beliefs, and behavior.

230. *Survey of Rhetorical-Communication Theory.* I. 3 hr. PR: Sp. Com. 11. Theory in the rhetorical communication context with emphasis on periods preceding the twentieth century.

231. *Communication and Symbolic Processes.* I, II. 3 hr. Relationships among language, thought, and action. How people use and react to language.

275. *Communication Problems of Children.* I, II. 3 hr. PR: Sp. Com. 11. Primarily for elementary and secondary school teachers and language arts supervisors. Normal maturational development of listening and speaking skills, their relationships to language acquisition, and influence upon achievement.

281. *Media in Communication and Education.* I, II. 3 hr. Use of the media in educational and other communication environments with emphasis on communication processes and principles relevant to television and film.

371. *Theory and Research in Language.* I, II, S. 3 hr. Syntactics, semantics, and pragmatics of language behavior. Analyses of contemporary linguistic theories.

372. *Theory and Research in Mass Communication.* I, II, S. 3 hr. Mass communication from a consumer's viewpoint. Use of consumer-oriented mass media research also stressed.

373. *Theory and Research in Persuasion.* I, II, S. 3 hr. Various theories and principles of persuasion with emphasis on contemporary research literature.

374. *Theory and Research in Intercultural Communication.* I, II, S. 3 hr. Advanced seminar in communication and change in various cultures. Special emphasis on research in diffusion of innovations and special topics such as communication strategies for population control, communication of technical information, etc. in the developing countries.

376. *Theory and Research in Organizational Communication.* I, II, S. 3 hr. Contemporary research linking communication variables and networks to organizational change, effectiveness, leadership, power, and management practices. Analysis of communication problems within a variety of organizations.

377. *Theory and Research in Interpersonal and Small Group Communication.* I, II, S. 3 hr. Specific research areas in interpersonal communication with intensive emphasis on small groups.

Statistics and Computer Science

Faculty

Donald F. Butcher, Ph.D. (Iowa St. U.), *Chairperson and Associate Professor of Statistics.*
Daniel M. Chilko, M.S. (Rutgers U.), *Assistant Professor of Statistics.*
Cynthia A. Dietz, M.S. (WVU), *Instructor (part-time) in Computer Science.*
William H. Dodrill, Ph.D. (MIT), *Visiting Associate Professor of Computer Science.*
Shirley M. Dowdy, Ph.D. (U. Notre Dame), *Assistant Professor of Statistics.*
Stanley Etersque, M.A.T. (Duke U.), *Instructor in Computer Science.*
Judith C. Hall, M.S. (Harvard U.), *Instructor in Statistics.*
E. James Harner, Jr., Ph.D. (Cornell U.), *Assistant Professor of Statistics.*
Robert W. Hoyer, Ph.D. (VPI), *Assistant Professor of Statistics.*
John C. Knight, Ph.D. (Newcastle-upon-Tyne U.), *Visiting Assistant Professor of Computer Science.*
John M. Krall, Ph.D. (U. Iowa), *Associate Professor of Statistics.*
James A. Kutsch, Jr., M.S. (WVU), *Instructor (part-time) in Computer Science.*
Malcolm G. Lane, Ph.D. (Duke U.), *Assistant Professor of Computer Science.*

Thomas W. McIntyre, Ph.D. (UCLA), *Associate Professor of Computer Science.*
Wayne A. Muth, Ph.D. (Iowa St. U.), *Professor of Computer Science.*
Carl E. Ortmeyer, Ph.D. (Iowa St. U.), *Assistant Professor of Statistics.*
David C. Rine, Ph.D. (U. Iowa), *Assistant Professor of Computer Science.*
Paul B. Slater, Ph.D. (U. Penn.), *Assistant Professor of Statistics.*
Phillip D. Stark, M.S. (U. Mo.), *Instructor in Statistics.*
William V. Thayne, Ph.D. (U. Ill.), *Assistant Professor of Statistics.*
Edwin C. Townsend, Ph.D. (Cornell U.), *Associate Professor of Statistics.*
George E. Trapp, Jr., Ph.D. (Carnegie-Mellon U.), *Assistant Professor of Computer Science.*
Vincent A. Uthoff, Ph.D. (U. Iowa), *Associate Professor of Statistics.*
Stanley Wearden, Ph.D. (Cornell U.), *Professor of Statistics; Dean of the Graduate School.*

Programs

The Bachelor of Science degree is designed to qualify a student for professional positions in industry, research, or government service. At the same time it prepares him for graduate study in his own discipline or in some other academic area of quantitative science. The Bachelor of Arts degree is not awarded with a major in Statistics or in Computer Science.

The field of statistics presents methods of making decisions on the basis of probability. The baccalaureate program in statistics is intended to train a student to combine the scientific method with mathematics and inductive reasoning in order to serve on a research team as a member who can design experiments, analyze the results and draw inference from them.

A student interested in a career in actuarial science should so inform the department after successful completion of Math. 17 and Stat. 262. At that time he can be nominated as qualified to take Part 1 and Part 2 of the actuarial examinations sponsored by the Society of Actuaries.

The program in computer science is intended to train a student to act as a human intermediary between a computational problem and a high speed electronic computer. To operate in that capacity he will need coursework concerning (1) the representation and transmission of information, (2) the computer and its supporting systems, and (3) computer methodologies.

Major in Statistics

Statistics majors must complete 24 hours of statistics, computer science, and/or mathematics beyond calculus. These must include 6 hours each in statistical methods, statistical theory, and applied statistics.

Required Courses

Math. 15, 16, 51; C.S. 1; Stat. 101, 201, 261, 262; 6 hours selected from the following: Stat. 215, 223, 231, 312, 333, 341, 351; 6 hours upper-division hours listed below in recommended electives or under applied statistics courses.

Recommended Electives

Any course listed above plus Stat. 361, 362; C.S. 2, 101, 120, 160, 220, 221, 230, 240, 241, 260, 261; Math. 163, 241, 251, 252, 291, 292; Econ. 51, 52; Management 111.

Major in Computer Science

Computer Science majors are required to complete 24 hours of upper-division coursework in computer science and 6 additional hours of upper-division coursework in computer science, statistics, or mathematics.

Required Courses

Math. 15, 16; Stat. 101; C.S. 101, 120, 160; at least 3 courses selected from C.S. 212, 220, 230, 240.

Recommended Electives

C.S. 112, 221, 223, 241, 260, 261; Stat. 201, 215, 231, 261, 262; Math. 51, 163, 251, 252, 291, 292; Econ. 51, 52; Mgmt. 111.

Courses of Instruction in Statistics

Stat.

Upper Division

101. *Elementary Statistical Inference.* I, II. 3 hr. PR: Math. 3. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression, correlation, chi-square and index numbers. (Equiv. to Econ. 125.)

201. *Intermediate Statistical Methods.* II. 3 hr. PR: Stat. 101. Extension of basic concepts of statistical models, elementary decision theory, estimation, random variable, one- and two-way classification models, analysis of variance, F-distribution, linear regression and correlation analysis. (Equiv. to Econ. 226.)

215. *Statistical Computer Techniques.* II. 3 hr. PR: A programming language, PR or Conc.: Stat. 201 or equiv. Generating random numbers and tests for randomness. Elementary simulations, estimations, and tests of hypotheses. Computational algorithms and interpretation of data using analysis of variance, regression, and multivariate analysis.

223. *Applied Matrix Algebra.* I. 3 hr. PR: Math. 18 or 51. Elementary matrix concepts and operations, vector spaces, characteristic roots and vectors, generalized inverses, systems of linear equations, patterned matrices, orthogonal and other special matrices. (Equiv. to C.S. 223 and Math. 233.)

231. *Sampling Methods.* I. 3 hr. PR: An introductory course in statistics. Methods of sampling from fininte and infinite populations, choice of sampling unit, sample survey design, estimation of confidence limits and optimum sample size, and single and multi-stage sampling procedures.

261. *Statistics and Probability 1.* I. 3 hr. PR: Math. 16. Probability, discrete and continuous probability distributions, expectations, sums of random variables, sampling distributions, point and interval estimation, tests of hypotheses.

262. *Statistics and Probability 2.* II. 3 hr. PR: Stat. 261. Statistical inference and decision theory; properties of hypotheses; bivariate and multivariate distributions; least squares procedures.

291. *Special Topics.* I, II, S. 1-6 hr. Advanced study of special topics in statistics.

311. *Statistical Methods 1.* I, II. 3 hr. PR: Math. 3. Statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression, correlation, transformations, F and Chi-square distributions, analysis of variance and multiple range tests. (Equiv. to Ed. Psych. 311 and Psych. 311.)

312. *Statistical Methods 2.* I, II. 3 hr. PR: Stat. 201 or 311. Extension of basic concepts of statistical models, design of experiments, multiway classification models, factorials, split plot design, simple covariance, orthogonal comparisons, multiple linear and nonlinear regression and correlation analysis. (Equiv. to Ed. Psych. 312 and Psych. 312.)

321. *Design of Experiments.* I. 3 hr. PR: Stat. 312 or equiv. Design and analysis of experiments over time and space, fractional replications, incomplete block designs, cross-over designs, lattice designs, and least squares analysis for unequal subclass numbers.

333. *Nonparametric Statistics.* II. 3 hr. PR: An introductory course in statistics. Single sample tests; tests for related samples, two independent samples, k related samples, k independent samples; and measures of correlation.

341. *Multivariate Methods 1.* I. 3 hr. PR: Stat. 201 or 311. Introduction to elementary matrix operations, partial and multiple linear and non-linear correlation and regression analysis, and introduction to discriminant analysis.

342. *Multivariate Methods 2.* II. 3 hr. PR: Stat. 341 or equiv. Multivariate normal distribution, tests of hypotheses about the sample mean vectors and variance-covariance matrices from a miltivariate normal distribution, and analysis of variance of multiple responses in basic statistical designs.

351. *Applied Regression Analysis.* I. 3 hr. PR: Stat. 312. Matrix approach to linear and multiple regression, selecting the "best" regression equation, model building, and linear models approach to analysis of variance and analysis of covariance.

361. *Theory of Statistics 1.* I. 3 hr. PR: Math. 51. Probability and random variables, univariate and multivariate probability distributions, expectations, moments, marginal and conditional distributions, independence, correlation, transformations, and functions of random variables.

362. *Theory of Statistics 2.* II. 3 hr. PR: Stat. 361. Estimation including bias, consistency, efficiency and sufficiency, hypothesis testing, distribution-free problems, order statistics, linear models and analysis of variance, and special distributions.

Courses of Instruction in Computer Science

C.S.

Lower Division

1. *Introduction to Computer Science.* I, II, S. 4 hr. Algorithms, programs and computers. Organization and characteristics of computers. Basic programming structure.

2. *Computer Language Concepts.* I, II. 4 hr. PR: C.S. 1 or equiv. Problem oriented and machine oriented language and their uses. Programming in scientific, business, and assembly languages.

Upper Division

101. *Computers and Programming.* I. 3 hr. PR: C.S. 2. Basic computer organization, machine language programming and the use of assembly language programming systems. Micro-programming, macro definition and generation, program segmentation and linkage.

112. *Introduction to Discrete Structures.* I. 3 hr. PR: C.S. 1. Basic set algebra, algebraic structures, Boolean algebra and propositional logic. Directed and undirected graphs. Applications of these structures to various areas of computer science.

120. *Numerical Calculus.* II. 3 hr. PR: C.S. 2 and Math. 16. An introduction to the numerical algorithms fundamental to scientific computing. Includes discussion of error, polynomial interpolation, quadature, linear systems of equations, and nonlinear equations. The algorithmic approach and the efficient use of the computer are emphasized. (Equiv. to Math. 123.)

160. *Data Management.* II. 3 hr. PR: C.S. 101. Programming methodology for processing large quantities of data. Job control language, utility programs, data storage and retrieval. Writing efficient programs to solve complex problems.

212. *Data Structures.* I. 3 hr. PR: C.S. 160 or equiv. Basic concepts of data. Structures of storage media and machines. Methods of representing structured data in storage and techniques for operating on it.

220. *Numerical Analysis 1.* I. 3 hr. PR: Math. 16 and C.S. 120 or consent. Solutions of equations, interpolation and approximations. Numerical differentiation and intergration. Numerical solution of initial value problems in ordinary differential equations. (Equiv. to Math. 321.)

221. *Numerical Analysis 2.* II. 3 hr. PR: Math. 17 and C.S. 120 or 220 or consent. Solutions of linear systems by direct and iterative methods. Matrix inversion, evaluation of determinants, and calculation of eigenvalues and eigenvectors of matrices. Application to boundary value problems in ordinary differential equations. (Equiv. to Math. 322.)

223. *Applied Matrix Algebra.* I. 3 hr. PR: Math. 18 or 51. Elementary matrix concepts and operations, vector spaces, characteristic roots and vectors, generalized inverses, systems of linear equations, patterned matrices, orthogonal and other special matrices. (Equiv. to Stat. 223 and Math. 223.)

230. *Programming Languages.* I. 3 hr. PR: C.S. 212. Formal definition of programming languages including specification of syntax and semantics. Structure of simple statements and algorithmic languages. List processing and string manipulation languages.

240. *Systems Programming.* I. 4 hr. PR: C.S. 212. Software organization for the support of computer components. Addressing techniques process and data modules, file system organization and management. Traffic control and communication with peripheral devices.

241. *Systems Programming.* II. 3 hr. PR: C.S. 240. Memory management; name management; file systems; segmentation; protection; resource allocation; pragmatic aspects in the design and analysis of operating systems.

248. *Programming Small Computers.* II. 3 hr. PR: C.S. 160. Processing of data using small laboratory digital computers.

260. *Information Analysis.* I. 3 hr. PR: Econ. 52, Mgmt. 112, C.S. 160. Information analysis and logical design of a computer system. Exercises and case studies are used to give students proficiency in information analysis techniques. Projects assigned to provide practical experience in systems development and implementation.

261. *System Design.* II. 3 hr. PR: C.S. 260. Underlying principles of system design and techniques. A theme to be carried throughout the course is the iterative nature of the analysis and design process. Implementation and conversion problems also are considered. Practical projects assigned to give students experience in actual situations.

291. *Special Topics.* I, II, S. 1-6 hr. PR: Consent. Advanced study of special topics in computer science.

301. *Computers in Research 1.* I, S. 3 hr. Use of computers in research. Organization and characteristics of computers. Algorithms, machine language programming, scientific oriented language programming subprograms, program segmentation and linkage. (Statistics and Computer Science majors should get approval of their graduate committee before taking this course for credit.)

302. *Computers in Research 2.* II. 3 hr. PR: C.S. 301. Computer techniques in research. Data retrieval, scientific and business data processing, survey methods. Simulation and simulation languages. Formal definition of programming languages. (Statistics and Computer Science majors should get approval of their graduate committee before taking this course for credit.)

320. *Numerical Solution of Linear Equations.* 3 hr. PR: C.S. 221 or consent. Numerical solution of large systems of linear equations using direct and iterative methods. Calculation of inverses and generalized inverses of matrices. Numerical methods for the determination of eigenvalues and eigenvectors.

330. *Design of Language Processors.* II. 3 hr. PR: C.S. 230. Study of the design and construction of automatic programming language processors. Investigation of the structure of scientific and business oriented compilers, list processors and information processing languages.

340. *Design of Programming Systems.* II. 3 hr. PR: C.S. 241. Design of monitor systems, executive systems and operating systems for high speed digital computers. Emphasis placed on current generation computers with multiprogramming, interactive, teleprocessing, and real time capabilities.

College of Business and Economics

The College of Business and Economics prepares students to work in business firms and other complex organizations. Whether you intend to operate a small firm or expect to join a large corporation, your program in business and economics will help you develop managerial skills.

A well-rounded selection of liberal arts courses contributes to your personal development. Courses such as statistics and business English assist you with your upper-division course load and also are helpful in your career. Special fields of interest are accounting, economics, finance, management, and marketing. Flexibility with electives allows you to strengthen your program in special areas.

Teaching methods used in the College include lectures, laboratories, cases, guest lectures, field trips, and internships. Closed circuit video, telelecture, and other modern teaching technologies supplement class work.

Bureau of Business Research

The Bureau of Business Research is the organized research division of the College of Business and Economics. Its mission includes identifying research needs and opportunities, developing research proposals, and providing staff assistance in managing and executing research projects. The program is carried out by faculty members and others under the general supervision of the director of the Bureau of Business Research, which provides research training opportunities for both graduate and undergraduate students. The Bureau also serves as a research information center for faculty and staff and other agencies, both on and off campus, by maintaining a research library containing 130 periodicals and 4,000 books and pamphlets, with emphasis on material related to West Virginia. As a member of the Association for University Business and Economic Research, the Bureau receives most publications of member organizations, thus bringing to WVU an extensive collection of business and economic research performed by other academic institutions.

The Bureau also publishes a nationally circulated quarterly, the *Journal of Small Business Management,* with the National Council of Small Business Management Development. Since its founding in 1949, the Bureau has published over seventy research monographs in four series dealing with many aspects of the West Virginia or national economies, which have been distributed throughout the nation and the world.

Administrative Officers

Jack T. Turner, D.B.A. (Ind. U.), *Dean of College of Business and Economics.*
Robert B. Conner, M.B.A. (WVU), *Director of Special Programs.*
Leo Fishman, Ph.D. (NYU), *Chairperson of Department of Economics.*
Thomas S. Isaack, D.B.A. (Ind. U.), *Chairperson of Department Business.*
Dennis R. Leyden, B.S. (Clemson U.), *Director of Bureau of Business Research.*
Patrick C. Mann, Ph.D. (Ind. U.), *Director of Graduate Programs in Economics.*
Joseph Newhouse, M.S. (WVU), *Director of Undergraduate Programs and Administrative Assistant to the Dean.*

Ben Tuchi, Ph.D. (St. Louis U.), *Director of Graduate Programs in Business and Industrial Relations.*

Faculty

Peter Anderson, J.D. (WVU), *Instructor in Business Law.*
Billy Bruce Atkins, J.D. (WVU), *Instructor in Business Law.*
Vance Q. Alvis, Ph.D. (U. Va.), *Professor of Economics.*
Lee S. Balliet, M.A. (Kent St. U.), *Assistant Professor of Economics.*
James Balser, M.B.A. (WVU), *Instructor in Marketing.*
Lewis C. Bell, Ph.D. (U. Ky.), *Professor of Economics.*
Gary K. Bennett, M.B.A. (WVU), *Instructor in Accounting.*
Robert D. Britt, Ph.D. (U. Colo.), *Associate Professor of Economics.*
Jay Bucklew, M.B.A. (WVU), *Instructor in Management.*
Thomas C. Campbell, Jr., Ph.D. (U. Pitt.), *Professor of Economics.*
Jay Coats, M.B.A. (U. Pitt.), *Assistant Professor of Accounting.*
Robert B. Conner, M.B.A. (WVU), *Assistant Professor of Marketing.*
Brent Dalrymple, Ph.D. (LSU), *Associate Professor of Finance.*
Edward K. Dix, Ph.D. (U. Md.), *Assistant Professor of Economics.*
George R. Dreese, Ph.D. (Ohio St. U.), *Associate Professor of Economics.*
Randyl Elkin, Ph.D. (Iowa St. U.), *Assistant Professor of Economics.*
Betty G. Fishman, M.A. (NYU), *Associate Professor of Economics.*
Leo Fishman, Ph.D. (NYU), *Professor of Economics.*
Michael Fogarty, M.A. (Portland St. U.), *Assistant Professor of Economics.*
John R. Goodwin, J.D. (WVU), *Associate Professor of Business Law.*
Waylon D. Griffin, Ph.D. (U. Tex.), *Assistant Professor of Marketing.*
Carter L. Grocott, M.B.A. (WVU), *Assistant Professor of Marketing.*
Raymond M. Haas, D.B.A. (Ind. U.), *Professor of Marketing.*
John Harpell, Jr., M.B.A. (Ga. St. U.), *Assistant Professor of Management.*
Harvey Hegarty, Ph.D. (U. N.C.), *Assistant Professor of Management.*
Richard W. Humphreys, M.A. (U. Wisc.), *Assistant Professor of Economics.*
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Parviz Jenab, M.A. (Ind. U.), *Instructor in Economics.*
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George E. Kirk, J.D. (WVU), *Assistant Professor of Management.*
Forrest H. Kirkpatrick, LL.D. (Bethany C.), *Visiting Professor of Management.*
Stanley Kloc, M.B.A. (WVU), *Instructor in Management.*
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Thomas Loehr, B.S. (WVU), *Instructor in Accounting.*
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Philip Mahin, M.B.A. (U. Penn.), *Assistant Professor of Marketing.*
Patrick C. Mann, Ph.D. (Ind. U.), *Associate Professor of Economics.*
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Wendell G. Marston, M.A. (VPI), *Assistant Professor of Management.*
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William H. Miernyk, Ph.D. (Harvard U.), *Professor of Economics*
Austin Montgomery, Ph.D. (N. Tex. St. U.), *Associate Professor of Management.*
Adolph Neidermeyer, M.A. (Ohio St. U.), *Assistant Professor of Accounting.*
Joseph Newhouse, M.S. (WVU), *Associate Professor of Finance.*
Catherine Palomba, Ph.D. (Iowa St. U.), *Assistant Professor of Economics.*
Neil Palomba, Ph.D. (U. Minn.), *Associate Professor of Economics.*
Suzanne E. Reid, Ph.D. (Duke U.), *Assistant Professor of Economics.*

Evan O. Roberts, Ph.D. (U. Wisc.), *Professor Emeritus.*
James M. Rovelstad, Ph.D. (U. Mich.), *Associate Professor of Marketing.*
Dietrich L. Schaupp, M.B.A. (WVU), *Assistant Professor of Management.*
Gail A. Shaw, Ph.D. (U. Miss.), C.P.A., *Associate Professor of Accounting.*
Kenneth L. Shellhammer, Ph.D. (U. Colo.), *Assistant Professor of Economics.*
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Wil J. Smith, Ph.D. (U. Wisc.), *Assistant Professor of Economics.*
Randolph Stenger, M.B.A. (WVU), *Instructor in Marketing.*
Ward Stone, J.D. (WVU), *Instructor in Business Law.*
James Summer, Ph.D. (Ohio St. U.), *Instructor in Management.*
Larry Sweeney, M.B.A. (WVU), *Instructor in Finance.*
Owen A. Tapper, Ph.D. (U. Wisc.), *Assistant Professor of Economics.*
James H. Thompson, Ph.D. (U. Pitt.), *Professor of Economics.*
Anthony M. Tuberose, Ph.D. (U. Tex.), *Associate Professor of Finance.*
Ben Tuchi, Ph.D. (St. Louis U.), *Associate Professor of Finance.*
Jack T. Turner, D.B.A. (Ind. U.), *Professor of Marketing.*
Daniel F. Twomey, D.B.A. (Kent St. U.), *Assistant Professor of Management.*
Royce J. Watts, M.S. (WVU), *Assistant Professor of Economics.*
Thomas S. Witt, M.A. (Wash. U.), *Assistant Professor of Economics.*
Fred E. Wright, Jr., A.M. (WVU), *Professor of Finance.*
Gregory Yi, Ph.D. (SUNY, Buffalo), *Assistant Professor of Economics.*
Fred A. Zeller, Ph.D. (Ohio St. U.), *Associate Professor of Economics.*

Admission

High school students interested in professional careers in accounting, economics, finance, management, or marketing should seek admission in the pre-business and economics program in the College of Arts and Sciences. On-campus students or transfer students from other institutions may seek admission into the College of Business and Economics upon the completion of 58 or more semester hours.

High school graduates interested in professional programs in business administration and economics must meet the minimum requirements for admission to WVU. Prospective students should file applications with the Dean of Admissions and Records and stipulate the "Pre-Business and Economics Programs."

Additional information concerning admission, registration, fees and expenses, regulations, etc. is in Part 2 of this *Catalog.*

Accreditation

The College of Business and Economics is accredited not only through the approval of WVU by national and regional accrediting agencies, but also through full membership in the American Association of Collegiate Schools of Business. This association is the only accrediting agency in the field of professional education for business at the collegiate level.

Second Bachelor's Degree

A student who has received a bachelor's degree from an approved college or university may become eligible for a second bachelor's degree in business administration or economics by earning a minimum of 30 semester hours of credits in residence in such courses as the Dean may prescribe.

Work Taken at Other Institutions

Students who expect to obtain a degree from the College of Business and Economics and who wish to take work at other institutions must have their programs approved by the Dean of the College of Business and Economics before registering at another institution of higher learning. Ordinarily required courses must be taken at WVU.

Requirements for Degrees

Bachelor's Degree

To qualify for either the Bachelor of Science in Business Administration or Bachelor of Science in Economics degrees, the student must have:

1. Earned 128 semester hours of credit with a 2.0 (C) grade-point average on all work attempted at WVU. In addition, all students entering the College of Business and Economics are required to maintain at least a 2.0 average on work attempted after their admission to the College.

2. Earned 128 semester hours of credit in subjects other than in Mathematics 2. A maximum of 6 hours of credit in Advanced Military Science (ROTC) or Air Force Aerospace Studies (ROTC) will be allowed toward graduation and is counted as a non-Business and Economics elective. Students who elect a foreign language must complete at least 6 hours in the same language.

3. Earned at least 60 hours of credit in upper-division (those numbered 100 or higher). Within the 60 hours, aside from required and elective courses in the College, majors in economics must complete 18 upper-division hours outside the College and business majors must have 9 upper-division hours outside the College.

4. Earned at least 30 hours of credit while enrolled in this College and in residence.

5. Satisfied the requirements of WVU Core Curriculum.

6. Satisfied the course requirements of one of the Business and Economics curricula described below.

Undergraduate Curricula

The College of Business and Economics offers two degrees — Bachelor of Science in Business Administration and Bachelor of Science in Economics. Programs leading to these degrees are designed to enable students to obtain a balanced selection of courses in liberal arts, a broad base of study in business and economics, and concentrated work in major areas of interest.

	B.S. in Business Administration	B.S. in Economics
Non-Business and Economics		
	Hr.	*Hr.*
English 1 and 2—Composition & Rhet.	6	6
Core Group A Courses		
English 8—Intermediate Composition	3	—
Speech Communication		
Sp. Com. 11	1	1
Sp. Com. 12 or 13 or 14	2	2
Other Group A electives	6	9
Core Group B Courses		
Pol. Sci. 2—American Fed. System	3	3
Psych. 1—Intro. to Psychology	3	3
S.A. 1—Intro. to Sociology	3	3
Other Group B electives (non-econ.)	6	6
Core Group C Courses		
Math. 3—College Algebra	3	3
Math. 28—Finite Math.	3	3
Other Group C electives	6	6
Physical Education—General Program	2	2
Other Electives—Non-bus. and econ.	18	21
	—	—
Total Non-Business and Economics	65	68
Unrestricted Electives	3	6
B.S. in Business Administration		
Required College Core Courses		
Acctg. 51 and 52—Principles		6
Econ. 51 and 52—Principles		6
Econ. 125—Statistics		3
Econ. 130—Money and Banking		3
Econ. 160—Labor Economics		3
Bus. Law 111—Legal Environment		3
Finan. 111—Business Finance		3
Mgmt. 111—Manufacturing		3
Mkt. 111—Marketing		3
Mgmt. 225—Business Policy		3
		—
		36
Accounting Majors		
Acctg. 111 and 112—Intermediate Accounting		6
Acctg. 113—Advanced Accounting		3
Acctg. 115—Cost Accounting		3
Acctg. 211—Accounting Systems or Acctg. 217—Auditing Theory		3
Bus. Law 112—Commercial Law		3
Electives—Business and Economics		6
		—
		24

Mgmt. 225, Business Policy, is required for all accounting majors who enter the College of Business and Economics (not just the University) in or after August 1974.

Business Management Majors	Hr.
Acctg. 115—Cost Accounting	3
Mgmt. 112—Production Planning and Control	3
Mgmt. 216—Personnel Management	3
Electives—Business and Economics	15
	24

Finance Majors	
Econ. 241—Public Finance	3
Finan. 112—Financial Management	3
Finan. 150—Investments	3
Electives—Business and Economics	15
	24

Marketing Majors	
Mkt. 112—Marketing Management	3
Mkt. 120—Advertising	3
Mkt. 215—Marketing Research	3
Electives—Business and Economics	15
	24

B.S. in Economics

Required College Core Courses	
Acctg. 51 and 52—Principles	6
Econ. 54 and 55—Principles	6
Econ. 125—Statistics	3
Econ. 211—Micro Economic Analysis	3
Econ. 212—Macro Economic Analysis	3
Econ. 216—History of Economic Thought	3
	24

College Electives[1]	
Economics	15
Business	9
Economics or Business	6

Distribution: At least one course (three credit hours) from three of the four areas of concentration.

Concentration: At least three courses (nine credit hours) in one area of concentration.

Areas of Concentration

Quantitative Analysis[2]
- Econ. 220—Introduction to Quan. Analysis
- Econ. 226—Advanced Statistics
- Econ. 200—Special Topics[3]

[1]The changes will be effective for all students seeking a B.S. in Economics degree who entered the College of Business and Economics in or after the First Semester, 1973-74. Students who entered the College before August, 1973, may elect to follow the previous *Catalog* program or the new *Catalog* program.

[2]Students wishing to concentrate in quantitative analysis may supplement the areas with courses approved by the adviser in mathematics and/or statistics. Students must still take a minimum 15 hr. of electives in economics.

[3]The Special Topics course must be selected from the relevant area of concentration. Does not preclude students from taking additional courses (max. of 9 hr.) in the several 200 series of Special Topics courses.

Public Sector and Private Enterprise
Econ. 130—Money and Banking
Econ. 241—Public Finance
Econ. 245—Government and Business
Econ. 246—Transportation
Econ. 200—Special Topics[3]

Human Resources
Econ. 160—Labor Economics
Econ. 261—Trade Unions
Econ. 262—Collective Bargaining
Econ. 263—Economics of Wages
Econ. 265—Economics of Social Security
Econ. 200—Special Topics[3]

Regional, International and Development
Econ. 210—Comparative Economic Systems
Econ. 213—Economics Development
Econ. 250—International Economics
Econ. 255—Regional Economics
Econ. 270—Strategic Factors in American Economic Growth
Econ. 200—Special Topics[3]

Pre-Business and Economics Program

Pre-Business and Economics students are expected to complete the program within their first two years of residence at the University. Pre-Business and Economics students will be transferred automatically to the College of Business and Economics when they have completed 58 credit hours.

Students must observe WVU Core Curriculum requirements as to distribution of elective courses. During the four years, the student must complete 12 hours of Group A electives including required Group A courses (Speech Com. and English 8), 15 hours of Group B electives other than economics but including required Group B courses (Psych. 1, Sociol. 1, and Pol. Sci. 2), and 12 hours of Group C electives including the required Group C courses (Math. 3 and Math. 28) from the list of approved elective courses.

Students must have completed or be taking Economics 125 (Statistics) before any other 100-level course in the Business and Economics "core" can be taken. In addition, such students are restricted to the 100-level Business and Economics "core" courses and certain specified exceptions until Economics 125 is completed successfully.

FRESHMAN YEAR				SOPHOMORE YEAR			
*First Sem.**	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
English 1	3	English 2	3	Acctg. 51	3	Acctg. 52	3
Econ. 54	3	Econ. 55	3	Math. 28[2]	3	Econ. 125	3
Pol. Sci. 2	3	Math. 3	3	Sp. Com. 11	1	Core A	3
Psych. 1	3	Sociol. 1	3	Sp. Com. 12		Core B	3
Phys. Ed.[1]	1	Phys. Ed.	1	or 13 or 14	2	English 8	3
Core C	3	Core C	3	Core A	3		
				Core B	3		
	16		16		15		15

*The student deficient in mathematics, as evidenced by the ACT score, must take Math. 2, the remedial algebra course, during the first semester of residence in order to prepare for Math. 3 and 8 required in subsequent semesters

B.S. in Business Administration Programs

ACCOUNTING[1]

JUNIOR YEAR				SENIOR YEAR			
First Sem.[2]	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Acctg. 111	3	Acctg. 112	3	Acctg. 211 (or		Acctg. 113	3
Acctg. 115	3	Bus. Law 112	3	Acctg. 217—		Econ. 130	3
Bus. Law 111	3	Mgmt. 111	3	2nd Sem.)	3	Electives—	
Finance 111	3	Mkt. 111	3	Econ. 160	3	Bus. or Econ.	3
Electives—		Electives—		Electives—		Electives—	
Outside	6	Outside	6	Bus. or Econ.	6	Outside	3
				Electives—		Electives—	
				Outside	3	Unrestricted	3
	18		18		15		15

BUSINESS MANAGEMENT[1]

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Bus. Law 111	3	Acctg. 115	3	Econ. 130	3	Mgmt. 225	3
Mgmt. 111	3	Finance 111	3	Mgmt. 216	3	Electives—	
Mkt. 111	3	Mgmt. 112	3	Electives—		Bus. or Econ.	3
Electives—		Econ. 160	3	Bus. or Econ.	6	Electives—	
Bus. or Econ.	6	Electives—		Electives—		Outside	3
Electives—		Outside	3	Outside	3		
Outside	3	Electives—				Electives—	
		Bus. or Econ.	3			Unrestricted	3
	18		18		15		15

FINANCE[1]

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Bus. Law 111	3	Finance 112	3	Econ. 160	3	Econ. 241	3
Econ. 130	3	Mgmt. 111	3	Finance 150	3	Mgmt. 225	3
Finance 111	3	Mkt. 111	3	Electives—		Electives—	
Electives—		Electives—		Bus. or Econ.	6	Bus. or Econ.	3
Bus. or Econ.	3	Outside	6	Electives—		Electives—	
Electives—		Electives—		Outside	3	Outside	3
Outside	6	Bus. or Econ.				Electives—	
						Unrestricted	3
	18		18		15		15

MARKETING[1]

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Bus. Law 111	3	Econ 160	3	Econ. 130	3	Mkt. 215	3
Mgmt. 111	3	Finance 111	3	Mkt. 120	3	Mgmt. 225	3
Mkt. 111	3	Mkt. 112	3	Electives—		Electives—	
Electives—		Electives—		Bus. or Econ.	6	Bus. or Econ.	3
Bus. or Econ.	3	Outside	6	Electives—		Electives—	
Electives—		Electives—		Outside	3	Outside	3
Outside	3	Bus. or Econ.			3	Electives—	
						Unrestricted	3
	15		18		15		15

[1]A minimum of 128 hours of credit must be earned in subjects other than Math. 2. A maximum of 30 credit hours in Accounting is permitted in the 128-hour requirement.

[2]The student deficient in mathematics, as evidenced by the ACT score, must take Math. 2, the remedial algebra course, during the first semester in residence in order to prepare for Math. 3 and 28 required in subsequent semesters.

B.S. in Economics Program*

The economics program is designed for those who wish to emphasize economics in their education for a business career, undertake graduate work for an advanced degree in this field, or for government service.

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Econ. 211	3	Econ. 212	3	Electives—Bus.	3	Econ. 216	3
Electives—Bus.	3	Electives—Bus.	3	Electives—Econ.	6	Electives—Bus. or Econ.	3
Electives—Econ.	3	Electives—Econ.	6	Electives—Bus. or Econ.	3	Electives—Outside	3
Electives—Outside	9	Electives—Outside	6	Electives—Outside	3	Electives—Unrestricted	6
	18		18		15		15

*The student must earn at least 60 hours in upper-division courses (numbered 100 or higher). The apparent excess requirement of 6 hours (total of 66 hours indicated under each program) provides for the completion of the University Core program which may be at the lower-division (courses numbered 1 to 99) or upper-division levels. However, the student must take a minimum of 9 hours of upper-division non-commerce electives in the various Business programs and 18 hours in the Economics program.

Courses of Instruction

(NOTE: Economics 52 or 54 is a prerequisite for all upper-division courses.)

Accounting

Acctg.

51. *Principles of Accounting.* I, II. 3 hr. PR: Sophomore standing. The fundamentals of accounting for business enterprises: the accounting cycle, journals and ledgers, working papers, statements.

52. *Principles of Accounting.* I, II. 3 hr. PR: Acctg. 51. Further study the accounting process with emphasis on assets, liabilities, and net worth; manufacturing accounts; analysis of financial statements.

111. *Intermediate Accounting.* I. 3 hr. PR: Acctg. 52. Analysis of accounting theory and practice as applied to business firms; assets valuation, liabilities, income determination.

112. *Intermediate Accounting.* II. 3 hr. PR: Acctg. 111. A continuation of Acctg. 111.

113. *Advanced Accounting.* II. 3 hr. PR: Acctg. 112. Accounting for partnerships, consolidations, installment sales, consignments, receiverships, reorganizations, branches, foreign exchanges, and estates and trusts.

115. *Cost Accounting.* I, II. 3 hr. PR: Acctg. 52. Fundamentals of cost determination with emphasis on the significance of cost data and their interpretation; process, job-order, and standard costs.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Acctg. 112 or consent. Special topics relevant to accounting. Maximum of 9 semester hours in any or all courses numbered 200 offered by the College may be applied toward the bachelor's and master's degrees.

211. *Accounting Systems.* I. 3 hr. PR: Acctg. 112. Adaptation of accounting procedures to demands of firms. Emphasis on use of quantitative tools, the use of computers in accounting, the systems concept, and the human behavioral implications of accounting.

213. *Income Tax Accounting.* I. 3 hr. PR: Acctg. 112 or consent. Tax theory and practice as developed from the Internal Revenue Code, regulations, rulings and court decisions; problems in preparation of tax returns for individuals, partnerships, and corporations.

214. *Income Tax Accounting.* II. 3 hr. PR: Acctg. 213. Continuation of Acctg. 213 with emphasis on assessments, refunds, reorganizations, personal holding companies, and federal estate and gift taxes.

216. *Advanced Cost Accounting.* II. 3 hr. PR: Acctg. 115. Advanced work in the application of cost theory and procedures to cases and problems which emphasize the managerial use of cost information.

217. *Auditing Theory.* I or II. 3 hr. PR: Acctg. 112. Auditing fundamentals; objectives, standards and procedures; introduction to working-paper techniques; procedure statements of the American Institute of CPA's.

218. *Auditing Practice.* I or II. 3 hr. PR: Acctg. 217. Application of auditing theory and procedures, with emphasis on decisions which invoke judgment and are important in independent audits; audit working papers and reports; case studies.

224. *Advanced Accounting Problems.* I or II. 3 hr. PR: Minimum of 18 hours in accounting with an average grade of B or higher. Analysis and solution of representative CPA problems.

230. *Advanced Accounting Theory.* I or II. 3 hr. PR: Acctg. 112, 115, and consent. Critical analysis of accounting concepts and standards with emphasis on their origin, development, and significance.

Business Law

Bus. Law

111. *Legal Environment of Business.* I, II. 3 hr. The nature of law and the judicial system. The relationship of law, ethics, and cultural values to business enterprise. Substantive law of contracts, sales, and credit transactions and the social and economic consequences of court decisions.

112. *Commercial Law.* I, II. 3 hr. PR: Bus. Law 111. Substantive law of agency, partnerships, corporations, negotiable instruments, and property and their social and economic functions.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Bus. Law 112 or consent. Study of special topics relevant to business law. Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degrees.

Economics

Econ.

51. *The Economic System.* I, II. 3 hr. Analysis of the economic system. The pricing system, monetary system, determination of national income, and employment.

52. *Contemporary Economic Issues.* I, II. 3 hr. PR: Econ. 51. Analysis of current problems relating to the business system, government and the economy, natural and human resources.

54. *Principles of Economics.* I, II. 3 hr. Elementary microeconomic analysis. Not open to students who have taken Econ. 51 and 52 (without permission).

55. *Principles of Economics.* I, II. 3 hr. PR: Econ. 54. Elementary macroeconomic analysis. Not open to students who have taken Econ. 51 and 52 (without permission).

125. *Statistics.* I, II. 3 hr. PR: Math. 3, 8. Basic statistical methods employed in collection, presentation, analysis, and interpretation of business and economic data such as

analysis of frequency distributions, probability distributions, statistical inference, regression and correlation, time series, and index numbers.

130. *Money and Banking.* I, II. 3 hr. Our system of monetary and banking arrangements, viewed in relation to functioning of the economic system as a whole.

160. *Labor Economics.* I, II. 3 hr. An introduction to labor economics and labor relations in industry, including the interaction to economic forces, union policies, personnel practices, and labor law.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Econ. 52 or 54, or consent. Study of special topics relevant to economics. Maximum of 9 semester hours in any or all courses numbered 200 offered by this College may be applied toward the bachelor's and master's degrees.

205. *Current Economic Problems.* S. 3 hr. PR: Econ. 52 or 54 or consent. For students in education only. A course designed to acquaint public school teachers with reliable source material in economics and to instruct them in studying current economic problems.

210. *Comparative Economic Systems.* I or II. 3 hr. PR: Econ. 52 or 54. Structure and processes of existing economic systems throughout the world including review of basic principles of free enterprise, socialistic, communistic, and fascistic societies. Comprehensive analysis based on current and recent experiments in these economies.

211. *Micro Economic Analysis.* I or II. 3 hr. PR: Econ. 52 or 54. A study of price and output determination and resource allocation in the firm under various competitive conditions.

212. *Macro Economic Analysis.* I or II. 3 hr. PR: Econ. 52 or 54. An analysis of the forces which determine the level of income, employment, and output. Particular attention is given to consumer behavior, investment determination, and government fiscal policy.

213. *Economic Development.* I or II. 3 hr. PR: Econ. 52 or 54. Comprehensive study of problems, changes, and principal policy issues faced by non-industrialized countries in the process of economic development.

216. *History of Economic Thought.* I or II. 3 hr. PR: Econ. 52 or 54. Economic ideas in perspective of historic development.

220. *Introduction to Quantitative Analysis.* I or II. 3 hr. PR: Econ. 125. Study of the principal mathematical techniques employed in economic analysis; introduction to econometrics.

226. *Advanced Statistics.* II. 3 hr. PR: Econ. 125 or equiv. Advanced approach to statistical analysis with emphasis on probability, inference, and multivaried statistical techniques.

241. *Public Finance.* I, II. 3 hr. PR: Econ. 52 or 54. Governmental fiscal organizations and policy; taxes and tax systems with particular emphasis on the federal government and the state of West Virginia.

245. *Government and Business.* I or II. 3 hr. PR: Econ. 52 or 54. Government in its role of adviser and umpire; analysis of governmental policies and practices affecting business.

246. *Transportation.* I, II. 3 hr. PR: Econ. 52 or 54. Development of an inland transportation system and relations and policies of transport agencies.

250. *International Economics.* I or II. 3 hr. PR: Econ. 52 or 54. Development of trade among nations; theories of trade, policies, physical factors, trends, and barriers in international economics.

255. *Regional Economics.* I or II. 3 hr. PR: Econ. 52 or 54. Analysis of factors that promote or deter the economic growth of a region, with emphasis on such matters as popula-

tion shifts, economic base studies, industrial location analyses, input-output techniques, regional income estimation, local multiplier and cycle concepts, and role of government in regional growth.

261. *Trade Unionism.* I or II. 3 hr. PR: Econ. 160 or consent. The structure, government attitudes, and policies of organized labor; implications of union policy.

262. *Collective Bargaining.* I or II. 3 hr. PR: Econ. 160 or consent. Theory and practice of collective bargaining; contract issues, types of relationships, and role of government policy.

263. *Economics of Wages.* I or II. 3 hr. PR: Econ. 160 or consent. Determination of wage levels and structure; economic and institutional forces determining wage levels and differentials.

265. *Economics of Social Security.* I or II. 3 hr. PR: Econ. 52, 54, or consent. Our social and political efforts to provide economic security, including an examination of parallel developments of private insurance.

270. *Growth of the American Economy.* I, II. 3 hr. PR: Econ. 52 or 54. Central issues in the development of the American economy.

299. *Readings in Economics.* I, II, S. 1-3 hr. PR: Econ. 52 or 54. Students will develop and carry out a program of specialized readings under the supervision of a cooperating instructor.

Finance

Finan.

111. *Business Finance.* I, II. 3 hr. PR: Acctg. 51 and 52. A study of the activities of the finance manager in the planning, acquisition, and administration of funds used in a business enterprise.

112. *Financial Management.* II. 3 hr. PR: Finan. 111. Application of fundamentals and theory to the analysis of cases in business finance.

115. *General Insurance.* I, II. 3 hr. Theory of risk and its application to insurance; principles underlying all forms of insurance — life, property, casualty, fire, and surety.

120. *Life Insurance.* I. 2 hr. PR: Finan. 115. Principles of life-insurance protection; legal regulation of insurance companies.

150. *Investments.* I. 3 hr. PR: Finan. 111 or consent. Investment analysis and management for the individual and the financial institution.

161. *Real Estate.* II. 3 hr. Principles and practices of real estate business.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Finan. 111 or consent. Study of special topics relevant to finance. Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degrees.

216. *Risk Management.* II. 3 hr. PR: Finan. 115 or consent. A study of the transferable risks with which the entrepreneur must deal. Emphasis is on the process by which decisions are made for the handling of these risks, including an examination of the contributions and limitations of the insurance system.

Management

Mgmt.

105. *Management Process.* I, II. 3 hr. A study of management as a process comprised of the functions of planning, organizing, directing, and controlling business activities. Emphasis is placed on management as a rational, orderly, intellectual process for making resources productive.

111. *Manufacturing.* I, II. 3 hr. PR or Conc.: Econ. 125. Basic concepts of modern management with primary emphasis upon basic quantitative analytical techniques.

112. *Production Planning and Control.* I, II. 3 hr. PR: Mgmt. 111 and Econ. 125. Management of manufacturing and production activities with emphasis on coordination and control to achieve production goals. Extensive use of computer in this course.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Mgmt. 111 or consent. Study of special topics relevant to management. Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degree.

213. *Problems in Business Administration.* I, II, S. 1-3 hr. Selected management problems related to the total enterprise and the emerging technostructure, e.g., managerial and corporate strategy, utilization of resources, social responsibility and government relations, dynamics of the new industries.

216. *Personnel Management.* I, II. 3 hr. Leading and motivating people whose work behavior is influenced by technology, organization, and management style as those affect the individual and work groups. Problems in obtaining, developing, maintaining, and directing human resources for an organization.

225. *Business Policy.* I, II. 3 hr. PR: Senior standing and consent. Integrated study of policies, organization, facilities, and control techniques of business enterprises.

Marketing

Mkt.

111. *Marketing.* I, II. 3 hr. Analysis of those activities through which business firms direct the flow of their goods and services to consumers and users.

112. *Marketing Management.* II. 3 hr. PR: Mkt. 111. The application of fundamentals and theory to the analysis of marketing cases and the development of marketing strategies.

115. *Distribution Channels.* I, II. 3 hr. PR: Mkt. 111. Management of channel systems with emphasis on retail distribution, channel choice, strategies, control, and optimization within the context of role, power, conflict and communications.

120. *Promotion Management.* I, II. 3 hr. PR: Mkt. 111 and 112 or consent. The communication process and its application to marketing; analysis of concepts and techniques in advertising, personal selling, and sales promotion; and management and integration of a firm's promotional strategy.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Mkt. 111 or consent. Study of special topics relevant to marketing. Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degrees.

210. *Industrial Purchasing.* I. 3 hr. PR: Mkt. 111. A survey of corporate procurement problems facing modern purchasing executives.

215. *Marketing Research.* I, II. 3 hr. PR: Mkt. 111 and 112. Application of behavioral science and quantitative tools to solving marketing problems; research design, hypothesis testing, questionnaire construction, sampling and data analysis. Tools include statistical inference tests, decision theory, Chi-square, and regression and correlation.

PUPPET MOBILE
WEST VIRGINIA UNIVERSITY
CREATIVE ARTS CENTER

Creative Arts Center

The Divisions of Art, Drama, and Music comprise the Creative Arts Center, which strives to provide a comprehensive education in the arts by achieving a balance between comprehensive classroom study of the history, philosophy, and theory of the arts with creative expression and performance.

These goals are realized through a combination of a distinguished faculty and an outstanding facility, one of the finest performing arts centers in the nation. Internationally known scholars and performers serve on the faculty, including former Metropolitan Opera singers. Both student and faculty groups perform throughout the state and the world, enriching cultural life while obtaining valuable performing experience.

The WVU Creative Arts Center, with a 1,500-seat continental Concert Theatre, was designed to encourage the arts to interact and stimulate each other. The circular architecture, with the performing and exhibit areas centrally located, exposes faculty and students to the creative processes of those in other disciplines.

Through four-year curricula, the three divisions offer the following majors: Division of Art — Studio Arts and Art Education with areas of specialization in ceramics, graphic design, painting, printmaking, and sculpture; Division of Drama — Applied Drama, with an option in acting-directing or design and technical theatre, acting-voice, and general theatre; Division of Music — piano, voice, organ, and every band and orchestral instrument except harp; theory-composition, theory-music history, and music education, both vocal and instrumental emphasis.

Freshmen who enroll in the Creative Arts Center usually take half or more of their first-year courses in art, drama, or music because they have completed such college preparatory courses as history, mathematics, and science in high school. For most freshmen, this will be the first time they are studying the subjects that they like best for academic credit.

A number of Saturdays are scheduled throughout the school year for student conferences and auditions. For information or appointment, write or call the Assistant Dean, Creative Arts Center, West Virginia University, Morgantown, WV 26506; telephone (304) 293-4642.

Placement tests and auditions or a portfolio of the student's art work may be requested for admission to the Creative Arts Center (Music, Art, Drama).

Students transferring to the Creative Arts Center from other colleges and schools will be required to present a minimum grade-point average of 2.0. Exceptions may be made in the case of first-semester freshmen.

Advanced standing in the Division of Music in Applied Music and Music Theory is given only by examination.

Complete information concerning WVU admissions, registration, fees and expenses, regulations, etc. are in Part 2 of this *Catalog*.

Faculty

Richard E. Duncan, Ph.D. (U. Rochester), *Dean and Director of Creative Arts Center; Professor of Music.*

Clifford W. Brown, M.F.A. (Carnegie-Mellon U.), *Assistant Dean of Creative Arts Center; Professor of Music.*

Division of Music

Jon E. Engberg, D.M.A. (U. Rochester), *Associate Professor and Chairperson of Music. Cello, Chamber Music.*

James W. Benner, M.A. (Columbia U.), *Assistant Professor of Music. Vocal Diction, Repertoire; Opera Theatre; Piano.*

Thomas S. Brown, Ph.D. (Northwestern U.), *Assistant Professor of Music. Music Education.*

David L. Busch, D.M.A. (LSU), *Instructor in Music. Oboe, Chamber Music, Theory.*

Thomas S. Canning, M.M. (U. Rochester), *Professor of Music. Composition, Theory.*

Walter L. Coplin, M.M. (WVU), *Assistant Professor of Music. String Bass, Instrument Classes, Music Education.*

Jon Crain, *Professor of Music. Voice.*

Rose Crain, *Assistant Professor of Music. Voice.*

Harry Elzinga, Ph.D. (Ind. U.), *Assistant Professor of Music. Musicology, Theory, Collegium Musicum.*

Clyde N. English, D.S.M. (Union Theol. Sem.), *Associate Professor of Music. Organ.*

Philip J. Faini, M.M. (WVU), *Associate Professor of Music. Percussion, African Music.*

Mary Jane Glasscock, M.M. (WVU), *Instructor in Education. Music Education.*

Herman Godes, M.M. (Latvian St. Mus. Acad.), *Professor of Music. Piano.*

Joseph A. Golz, M.A. (Columbia U.), *Professor of Music. Director, Opera Theatre; Conducting; Choral Music.*

Leo Horacek, Ph.D. (U. Kans.), *Professor of Music; Chairperson, Music Education. Music Education.*

Barton Hudson, Ph.D. (Ind. U.), *Associate Professor of Music. Musicology, Harpsichord.*

Charles L. Krusenstjerna, D.M.A. (U. Rochester), *Associate Professor of Music. Clarinet, Saxophone.*

Mary Krusenstjerna, M.M. (U. Rochester), *Assistant Professor of Music (part time). Flute.*

Gerald Lefkoff, Ph.D. (Cath. U. of Am.), *Professor of Music. Theory, Electronic Music. Viola.*

Frank E. Lorince, Jr., Ph.D. (U. Rochester), *Professor of Music; Chairperson, Theory and Composition. Theory.*

Margaret S. Lorince, M.M. (U. Rochester), *Associate Professor of Music (part-time); Chairperson, Preparatory Department. Piano.*

Bernard R. McGregor, M.F.A. (Carnegie Mellon U.), *Associate Professor of Music. Voice.*

James E. Miltenberger, D.M.A. (U. Rochester), *Associate Professor of Music. Piano, Piano Repertoire.*

William R. Nelson, M.M. (Duquesne U.), *Instructor in Music. Piano.*

Jane R. Pestun, M.M. (WVU), *Instructor in Music. Piano.*

Donald C. Portnoy, D.M.A. (Peabody Cons. Mus.), *Associate Professor of Music; Chairperson, Applied Music. Violin; Conductor, University Symphony Orchestra; Conducting.*

Richard E. Powell, M.E. (S.W. Tex. St. C.), *Assistant Professor of Music. Low Brass Instruments.*

George E. Schafer, Ph.D. (U. Rochester), *Professor of Music; Chairperson, Graduate Studies. Musicology.*

Stephanie Shehatovich, *Instructor in Music — University Extension. Piano.*
Roger C. Sherman, M.M. (U. Rochester), *Associate Professor of Music. Trumpet.*
Edward Sprague, M.S. (Syracuse U.), *Associate Professor of Music — University Extension.*
David J. Sternbach, M.M. (Ind. U.), *Instructor in Music. French Horn, Chamber Music, Theory.*
Mary E. Stringham, M.A. (WVU), *Assistant Professor of Music. Music Education.*
R. Scott Stringham, Ph.D. (Cornell U.), *Associate Professor of Music. Choir, Musicology, Music Appreciation.*
June D. Swartwout, M.M. (WVU), *Assistant Professor of Music (part-time). Voice.*
Don G. Wilcox, M.A. (Cal. St. C., L. Beach), *Assistant Professor of Music. Director of Bands, Theory, Conducting.*
William O. Winstead, M.M. (WVU), *Associate Professor of Music. Bassoon, Theory.*
Frances Yeend, *Professor of Music. Voice.*

Division of Art

Urban Couch, M.F.A. (Cranbrook Acad. Art), *Professor and Chairperson of Art.*
Robert P. Anderson, Jr., M.F.A. (Alfred U.), *Assistant Professor of Art.*
Peter E. Charles, M.F.A. (Yale U.), *Assistant Professor of Art and Curator and Director of Acquisitions.*
John D. Clarkson, M.A. (U. Pitt.), *Professor of Art.*
Barbara A. Drainer, Ed.D. (Columbia U.), *Associate Professor of Art.*
Ben F. Freedman, M.A. (U. Ariz.), *Associate Professor of Art.*
Clifford A. Harvey, B.F.A. (Mpls. C. Art & Design), *Associate Professor of Art.*
Wendell E. McPherson, *Instructor (part-time) in Art.*
Thomas V. Nakashima, M.F.A. (U. N. Dame), *Instructor in Art.*
Charles E. Patton, A.M. (West. Res. U.), *Professor Emeritus.*
Will R. Petersen, M.F.A. (Cal. C. Arts & Crafts), *Associate Professor of Art.*
Margaret T. Rajam, A.M. (U. Mich.), *Associate Professor of Art.*
Stanley E. Shafer, M.F.A. (U. Colo.), *Assistant Professor of Art.*
William J. Thomas, B.F.A. (Phila. C. Art), *Assistant Professor of Art.*

Division of Drama

William R. McGraw, Ph.D. (U. Minn.), *Professor and Chairperson of Drama.*
Sam Boyd, Jr., M.F.A. (Carnegie Mellon U.), *Professor of Drama.*
Robert B. Burrows, Ph.D. (Ohio St. U.), *Professor Emeritus.*
Joe E. Ford, M.A. (WVU), *Associate Professor of Drama.*
Mary Kathryn Funderburk, M.A. (WVU), *Instructor in Drama.*
J. Michael Gillette, M.F.A. (Ohio U.), *Associate Professor of Drama.*
Albert Lipton, *Assistant Professor of Drama.*
John C. McIlwee, M.A. (WVU), *Instructor in Drama.*
Craig Martin, M.F.A. (Yale U.), *Assistant Professor of Drama.*
Adel A. Migid, M.F.A. (Ohio U.), *Instructor in Drama.*
Patrick B. Murphy, M.A. (U. Wash.), *Assistant Professor of Drama.*
Charles D. Neel, Ph.D. (Cornell U.), *Associate Professor of Drama.*
Frederick F. Ulrich, III, M.F.A. (Yale U.), *Assistant Professor of Drama.*

Division of Music

The student interested in a career in music has a wide range of occupations from which to choose. Most fall into one of three basic categories: performing, composing or arranging, and teaching. All of the curriculums leading to the Bachelor of Music degree prepare the student to teach the student's own principal instrument (or voice) in the private music studio. Students who complete one of the curriculums in Music Education will have satisfied course requirements to teach either vocal or instrumental music and general music in elementary and secondary schools, grades 1-12. With further study on the graduate level, students may qualify for teaching positions in a junior or community college, four-year college, or university. Others may enter a career in performance as a solo artist or as a member of an ensemble, or may compose or arrange music for performance.

In addition to these rather specialized opportunities, music graduates are qualified to seek positions in industry as consultants with book companies, editors, business managers, and executives. Musicians are sought by the music industry as consultants with manufacturers of musical instruments and supplies, and for positions in selling, in sales managing, and as business executives.

It is quite possible for a music major to move from one music curriculum to another, particularly during the freshman or sophomore year, without great loss of course credit. Music majors are encouraged to explore and to follow the curriculum for which they are best qualified and in which they can expect the greatest success. Evaluation of their work by the Division of Music faculty will aid these decisions.

The Division of Music is a member of the National Association of Schools of Music. The Music Education program offered in the Division is fully accredited by the National Council for Accreditation of Teacher Education. In addition to the undergraduate program, courses leading to the following graduate degrees are offered: Master of Music, Doctor of Philosophy, Doctor of Musical Arts, and Doctor of Education in cooperation with the College of Human Resources and Education.

The 37-member faculty brings a rich background in professional performance and musical scholarship, along with a sincere interest in students, to its teaching. Students find these dedicated teachers to be both demanding and sympathetic.

Faculty performing groups in the Division are the Abbey Brass Guild, Woodwind Quintet, the String Trio, and the West Virginia Symphonette. Student performing groups are Symphony Orchestra, three bands, three choral groups, Percussion Ensemble, Opera Theatre, Trombone Ensemble, Jazz Ensemble, Collegium Musicum, and numerous other chamber music ensembles.

Musical Organizations

After completing four semesters in one of the bands or the orchestra, especially qualified members of these organizations may continue service in them upon invitation and receive allowances in the form of remission of fees amounting to $30.00 per semester.

The *University-Community Symphony Orchestra* is open to all students, faculty members, and citizens of the community who are proficient in the playing of an orchestra instrument. The repertoire is that of the standard symphony orchestra, with special emphasis on contemporary American music. Full

rehearsals are held each Wednesday evening at 7:30, with sectional rehearsals scheduled twice weekly in the late afternoon. May be taken with or without 1 hour credit as Music 103.

The *University Singers* is an ensemble of 60 vocalists selected by audition. The group sings the standard choral repertoire and makes several off-campus appearances during the year. Three rehearsals per week. May be taken with or without 1 hour credit as Music 105.

The *Camerata Singers* is a chamber ensemble of 10 singers selected by audition. The repertoire of the group ranges from the Middle Ages to contemporary music. Two rehearsals per week. May be taken with or without 1 hour credit as Music 115, sec. 6.

The *Collegium Musicum* is devoted to the performance of music for small vocal or instrumental ensembles, primarily early music. Two rehearsals per week. May be taken for 1 or 2 hours credit as Music 334.

The *University Choral Union* is open to all University students who can satisfactorily sing a part. This organization offers opportunity to participate in the performance of major choral works. Two rehearsals per week. May be taken with or without 1 hour credit as Music 102.

The *Wind Ensemble* is a select group of approximately 40 wind and percussion players chosen by audition. This organization performs music particularly appropriate to its size and special characteristics. Two rehearsals per week. May be taken with or without 1 hour credit as Music 100, Sect. 01.

The *Concert Band* is open without audition to all qualified WVU students. It performs both traditional and contemporary band music. Two rehearsals per week. May be taken with or without 1 hour credit as Music 100, Sect. 02.

The *Mountaineer Marching Band* of 160 students is open to all qualified men and women in the University. Its activities are confined to the first semester during which time it presents music and formations at football games and other special occasions. Four rehearsals per week. May be taken with or without 1 hour credit as Music 100, Sect. 03.

The *Jazz Ensemble* is a stage band which performs many original compositions as well as those from the big band era and from the repertory of contemporary jazz bands. Membership is by audition. Two rehearsals per week. May be taken with or without 1 hour credit as Music 115, Sect. 07.

Bachelor of Music Degree

Acceptance. Before being accepted as a music major, each student must demonstrate satisfactory previous musical preparation through an entrance audition. These conference-auditions are held in Morgantown throughout the school year. A tape recording and other supporting material may be submitted when circumstances prevent a visit to Morgantown for this purpose. Dates of these auditions and details concerning them are available from the Chairperson of the Division of Music.

In addition to fulfilling the special requirements indicated below for the music curriculum of the student's choice, each student also must satisfy the following general requirements:

Grade Levels. Before graduation, each undergraduate student must satisfy specified minimum proficiency levels of performance (Grade Levels) on the student's major instrument (or voice) and piano (if piano is not the major instrument). A listing of the Grade Levels for each instrument is available from the Division of Music. The repertoire listed for each Level (or works of comparable technical and musical difficulty) is to be performed with musical understanding

as well as technical accuracy to satisfy the requirement. Students who do not meet indicated Grade Levels must make up their deficiencies as soon as possible, and are subject to probation. When the faculty feels the deficiencies are so great and the student's musical talent so minimal that the possibility of fulfilling graduation requirements is impossible, the student will be notified that his enrollment in the Division of Music will be terminated.

Keyboard Proficiency Examination. In addition to fulfilling the Grade Level requirement in piano indicated in the curriculum, each student is required to demonstrate proficiency in keyboard harmony by passing a special examination.

Recital and Concert Attendance. Each full-time undergraduate music major must maintain a satisfactory record of attendance at recitals and concerts presented at WVU during each semester of residence.

Participation in Musical Organizations. Each music major must participate in musical organizations as indicated in the curriculum. Scholarship recipients may be called upon to render special service (as participants in particular organizations or ensembles, as piano accompanists, etc.) as designated by the Division Chairperson.

Completion of Degree Requirements. The student is responsible for correctly fulfilling all graduation requirements. Each student should review the curriculum requirements both before and after every registration period so that errors or omissions will be detected immediately. *Transfer students* must establish transfer credit from other institutions as early as possible in their WVU study — hopefully during the first semester of residence. The Bachelor of Music degree is conferred upon any student who complies with the general regulations of the University concerning degrees, satisfies all entrance and departmental requirements, and completes one of the curriculums in music with a minimum overall grade-point average of 2.0 (C).

Applied Music Curriculums

The Applied Music curriculums are especially designed for students wishing to prepare themselves as performers or as teachers of a particular instrument or voice. The increased interest of society today in the arts is creating many new opportunities for the professional musician and for the private music teacher.

A student following an Applied Music curriculum should enter as a freshman having achieved Grade Level 6 on the student's major instrument, and must complete Grade Level 10 on that instrument to be eligible for graduation. In addition to presentation of a senior recital, Applied Music majors also must present three solo performances on the major instrument in student recitals.

Applied Music majors are encouraged to participate in the division's major performing organizations (Music 100-105). However, not more than 8 hours of credit will be counted toward requirements for graduation.

APPLIED CURRICULUM — PIANO

At least 2 of the 8 credit hours to be earned through participation in musical organizations (Music 100-105) must be as a member of a choral group (Music 102 or 105). A total of 16 credit hours of courses from Core groups B and C is required, with no less than 6 credit hours to be earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 61, 62	4	Music 63, 64	4
Music 31	1	Music 100-105	1
Music 100-105	1	English 2	3
English 1	3	Phys. Ed. 2	1
Phys. Ed. 1	1	Core B or C	3-4
Core B or C	3-4		
	17-18		16-17

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 65, 66	4	Music 67, 68	4
Music 33	2	Music 34	3
Music 100-105	1	Music 100-105	1
Music 115	1	Music 115	1
Music elective	2	Music elective	2
Elective	3	Elective	3
	17		18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 100-105	1	Music 231, 232,	
Music 115	1	330-333	3
Music 118	1	Music 100-105	1
Music 263	2	Music 115	1
Music 265	3	Music 119	1
Music elective	2	Music 264	2
Core A	3	Music elective	2
		Core B or C	3
	17		17

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 115	1	Music 115	1
Music 218	2	Music 219	2
Non-music		Music 299	2
elective	3	Music 100-105	1
Music 100-105	1	Music elective	2
Music elective	2	Core B or C	3-4
Core B or C	3-4		
	17		16

Total: 134 hr.

APPLIED CURRICULUM — ORGAN

In addition to the required Grade Level 10 in organ, this curriculum also requires achievement of Grade Level 5 in piano before graduation. At least 6 of the 8 credit hours to be earned through participation in musical organizations (Music 100-105) must be as a member of a choral group (Music 102 or 105). A total of 16 credit hours from Core groups B and C is required, with no less than 6 credit hours earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 110	2	Music 110	2
Music 61, 62	4	Music 63, 64	4
Music 31	1	Music 100-105	1
Music 100-105	1	English 2	3
English 1	3	Phys. Ed. 2	1
Phys Ed. 1	1	Core B or C	3-4
Core B or C	3-4		
	19-20		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 110	2	Music 110	2
Music 65, 66	4	Music 67, 68	4
Music 33	2	Music 34	3
Music 100-105	1	Music 100-105	1
Elective	3	Elective	3
	16		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Music 51	2	Music 231, 232,		Music 100-105	1	Music 100-105	1
Music 265	3	330-333	3	Music 218	1	Music 219	1
Music 263	2	Music 264	2	Non-Music elect.	3	Music 299	2
Music 118	1	Music 119	1	Music elective	4	Music elective	4
Music 100-105	1	Music 100-105	1	Core B or C	3-4	Core B or C	3-4
Music elective	2	Music elective	2				
Core A	3	Core B or C	3				
	18		16		16-17		15-16

Total: 136 hr.

APPLIED CURRICULUM — BAND OR ORCHESTRA INSTRUMENT

Flute, Oboe, Clarinet, Saxophone, Bassoon, Horn, Trumpet, Trombone, Euphonium, Tuba, Percussion, Violin, Viola, 'Cello, and Double Bass

In addition to the required Grade Level 10 on the major instrument, this curriculum also requires achievement of Grade Level 3 in piano before graduation. A total of 16 credit hours of courses from Core groups B and C is required, with no less than 6 credit hours earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music 67, 68	4
Music 31	1	Music 100		Music 33	2	Music 34	3
Music 100		or 103	1	Music 100		Music 100	
or 103	1	English 2	3	or 103	1	or 103	1
English 1	3	Phys. Ed. 2	1	Elective	3	Elective	3
Phys. Ed. 1	1	Core B or C	3-4				
Core B or C	3-4						
	19-20		19		16		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Music 171	2	Music 172	2	Music 231, 232,		Music 299	2
Music 118	1	Music 119	1	330-333	3	Music 115	1
Music 115	1	Music 115	1	Music 115	1	Music 100	
Music 100		Music 100		Music 100		or 103	1
or 103	1	or 103	1	or 103	1	Music elective	2
Music 263	2	Music 264	2	Music elective	2	Core B or C	3-4
Music 265	3	Core B or C	3-4	Non-music Elect.	3		
Core A	3			Core B or C	3-4		
	17		14-15		17-18		13-14

Total: 132 hr.

APPLIED CURRICULUM — VOICE

In addition to the required Grade Level 10 in voice, a student completing this curriculum must also achieve Grade Level 3 in piano before graduation. One year of either Italian, French or German is required, as is one course from each Core group (A, B, and C). A recommended distribution of the courses required in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music 67, 68	4
Music 31	1	Music 113	2	Music 33	2	Music 34	3
Music 113	2	Music 102		Music 113	2	Music 113	2
Music 102		or 105	1	Music 102		Music 102	
or 105	1	English 2	3	or 105	1	or 105	1
English 1	3	Phys. Ed. 2	1				
Phys. Ed. 1	1						
	18		17		15		16

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Music 19	2	Music 19	2	Music 118	1	Music 119	1
Music 263	2	Music 264	2	Music 19	2	Music 19	2
Music 265	3	Music 102		Music 218	2	Music 219	2
Music 102		or 105	1	Music 231, 232,		Music 299	2
or 105	1	For. Lang.	3	330-333	3	Music 102	
For. Lang.	3	Core B or C	3	Music 102		Music elective	2
Core B or C	3			or 105	1	Core A	3
				Music elective	3		
	18		15		16		17

Total: 132 hr.

APPLIED CURRICULUM — WOODWINDS

Applied music majors whose major instrument is in the woodwind family and who show strong performance ability on another woodwind instrument may qualify for the Applied Curriculum in woodwinds. Approval for admission to this curriculum will not be given by the woodwind faculty until after the first year of study. In addition to the senior recital (which may be given on more than one instrument), the student in this curriculum must present his three solo student recital performances on each of the three major instruments. Grade Level requirements for this curriculum are:

A primary major woodwind instrument: Grade Level 9.

Two secondary major woodwind instruments: Grade Level 7.

Two minor woodwind instruments: Grade Level 4.

Piano: Grade Level 2.

The recommended distribution of the required courses is the same as in the *Applied Curriculum — Band or Orchestra Instrument*, with the following changes:

1. Substitution of 4 credit hours in Music 110 and 2 credit hours in Music 115 for the 6 credit hours of electives during the second year.

2. Addition of 2 credit hours in Music 110 to the courses in the third year (increasing the total for the curriculum to 134).

3. Substitution of 4 credit hours in Music 110 for the 4 credit hours of Music electives in the fourth year.

Theory-Composition, Theory-Music History Curriculums

The Theory-Composition Curriculum concentrates on developing skills in musical analysis, composition, and arranging. Students pursuing the Theory-Music History Curriculum find more emphasis on history and less on musical composition.

Students in these curriculums will satisfy the 8 credit hour requirement for participation in a performing organization through registrations in Music 100-105, 115, or 334 (Band, Orchestra, Choral Union, University Choir, Chamber Music, or Collegium Musicum), with at least 4 credit hours being earned in a major performing group (Music 100-105). Majors in these curriculums must present two solo performances on the major instrument on student recitals before graduation.

Another language may be substituted for the indicated French, German, or Italian with the approval of the Chairperson of the Theory-Composition Department.

THEORY-COMPOSITION CURRICULUM

An average of at least B in the required freshman and sophomore theory courses (Music 61-68) or the consent of the Chairperson of the Theory-Composition Department is required for continuation in this curriculum. A theory-composition major should enter as a freshman having achieved Grade Level 4 on the student's major instrument, and must complete Grade Level 8 on that instrument before graduation. If piano is not the major instrument, Grade Level 4 in this instrument also must be established. A total of 16 credit hours of courses from Core groups B and C is required, with no less than 6 credit hours earned in either group. The Major Project (Music 266) must be in theory or composition. A recommended distribution of the required courses in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Music elective	2	Music elective	2	Music elective	2	Music elective	2
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music 67, 68	4
Music 31	1	Music 100-105		Music 33	2	Music 34	3
Music 100-105		or 115	1	Music 160	2	Music 160	2
or 115	1	English 2	3	Music 100-105,		Music 100-105,	
English 1	3	Phys. Ed. 2	1	or 115	1	or 115	1
Phys. Ed. 1	1	Core B or C	4	French, German,		French, German,	
Core B or C	4			or Italian 1	3	or Italian 2	3
	18		17		16		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Music elective	2	Music elective	2	Music elective	2	Music elective	2
Music 171	2	Music 172	2	Music 51	1	Music 51	1
Music 263	2	Music 264	2	Music 260	2	Music 266	2
Music 265	3	Music 260	2	Music 231, 330-333	3	Music 232, 330-333	3
Music 260	2	Music 100-105, 115, or 334	1	Music 100-105, 115, or 334	1	Music 174	2
Music 100-105, 115, or 334	1	French, German, or Italian 4	3	Core B or C	4	Music 100-105, 115, or 334	1
French, German, or Italian 3	3					Core B or C	4
	17		14		15		17

Total: 131 hr.

THEORY-MUSIC HISTORY CURRICULUM

A maximum of 16 credit hours of applied music credit (Music 110) will be counted toward the required Grade Level 7 on the major instrument. If the student's major instrument is not piano, 12 of the elective credit hours may be used to achieve the required Grade Level 4 in that instrument. A student wishing to take more than 6 of the elective credit hours in non-music courses may do so only with the consent of the Chairperson of the Theory-Composition Department. The Major Project (Music 266) must be in theory or music history. A recommended distribution of the courses required in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Elective	2	Elective	2	Elective	2	Elective	2
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music 67, 68	4
Music 31	1	Music 100-105, or 115	1	Music 33	2	Music 34	3
Music 100-105, or 115	1	English 2	4	Music 100-105, or 115	1	Music 100-105, or 115	1
English 1	3	Phys. Ed. 2	1	French, German or Latin 1	3	French, German or Latin 2	3
Phys. Ed. 1	1	Core B	3	Core B	3	Core B	3
Core B	3						
	17		16		17		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Elective	2	Elective	2	Music 160	2	Music 160	2
Music 171	2	Music 172	2	Music 332	3	Music 266	2
Music 263	2	Music 264	2	Music 100-105,		Music 100-105,	
Music 265	3	Music 232	3	115, or 334	1	115, or 334	1
Music 231	3	Music 100-105,		Lit. (English		Literature or	
Music 100-105,		115, or 334	1	or Foreign)	3	Art Apprec.	3
115, or 334	1	French, German,		Core C	4	Core C	4
French, German,		or Latin 4	3				
or Latin 3	3	Core C	4				
	18		19		15		14

Total: 134 hr.

Music Education Curriculums

Students successfully completing one of the Music Education curriculums will have satisfied course requirements for the Professional Certificate, Grades 1-12, and will be prepared to teach both instrumental and vocal music in these grades. Music majors wishing to qualify for a second teaching field in addition to music at the secondary level should consult the College of Human Resources and Education for requirements in teaching fields.

In order to qualify for student teaching, a student must have a 2.25 grade-point average in all work attempted, and a 2.0 average in education courses (normally C&I 7; Ed. Psych. 105, 106). Students may be called upon to do their student teaching during either semester of the fourth year, and it may be necessary for student teaching to be done outside Monongalia County.

A student following either Music Education curriculum should enter as a freshman having achieved Grade Level 3 on the student's major instrument, and must complete Grade Level 7 on that instrument to be eligible for graduation. The student also must present two solo performances on the major instrument in student recitals before graduation.

The Core group C requirement must be fulfilled through 8 credit hours in one of the following areas: biology, physical science, chemistry, physics, or geology.

MUSIC EDUCATION CURRICULUM — VOCAL EMPHASIS

Students wishing to emphasize preparation in vocal/choral music choose this curriculum. Those whose major instrument is not voice must complete Grade Level 3 in voice; those whose major instrument is not piano must complete Grade Level 3 in piano. Students in this curriculum satisfy the listed requirements in Music 240 (Clinic Chorus, Band, and Orchestra) by participation in Clinic Chorus. A recommended distribution of the required courses in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music 110	1	Music 110	1
Music 61, 62	4	Music 63, 64	4
Music 51	1	Music 51	1
Music 240	1	Music 102	
Music 31	1	or 105	1
English 1	3	English 2	3
Phys. Ed.	1	Core C	4
Core C	4	Elective	1
		Phys. Ed.	1
	—		—
	18		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music 110	2	Music 110	2
Music 33	2	Music 34	3
Music 65, 66	4	Music 67, 68	4
Music 51	1	Music 51	1
Music 102		Music 102	
or 105	1	or 105	1
Music 19	2	Music 49	2
Hist. 1-3	3	Hist. 1-3	3
Elective	1		
	—		—
	18		18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music 51	1	Music 51	1
Music 151	3	Music 152	3
Music 102 or		Music 240	1
or 105	2	Ed. Psych. 106	3
C&I 7	3	Soc. Sci. 2	3
Ed. Psych. 105	3	English 35, 36,	
Soc. Sci. 1		or 135, 136	3
Math. 21, 22		Elective	2
or 15	2		
Elective	1		
	—		—
	18		18

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 248	2	C&I 104	4
Music 48	3	C&I 187	4
Math. 22 or 15	2	C&I 188	4
English 35, 36,		C&I 287	4
or 135, 136	3		—
Art 30	3		16
Sp. Com. 11 & 12,			
or 13 or 14, or			
Drama 50	3		
Hlth. Ed. 102	2		
	—		
	18		

Total: 142 hr.

MUSIC EDUCATION CURRICULUM — INSTRUMENTAL EMPHASIS

Students wishing to emphasize preparation in music for band or orchestra instruments choose this curriculum. The 16 credit hours of applied music (Music 110) in this curriculum are to be used to achieve the following Grade Levels: major instrument — Grade Level 7; voice — Grade Level 1B; piano — Grade Level 2. Those whose major instrument is a keyboard instrument or voice must complete Grade Level 4 on a non-keyboard instrument. Students in this curriculum satisfy the listed requirements in Music 240 (Clinic Chorus, Band, and Orchestra) by two semesters participation in Clinic Chorus and two semesters in Clinic Band or Orchestra. One semester of Marching Band (Music 100, Sect. 03) is required for all wind and percussion players in the curriculum. A recommended distribution of the courses required in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2	Music 110	2	Music 110	2
Music 110	1	Music 110	1	Music 110	1	Music 110	1
Music 100 or 103	1	Music 100 or 103	1	Music 100 or 103	1	Music 100 or 103	1
Music 61, 62	4	Music 63, 64	4	Music 33	2	Music 34	3
Music 51	1	Music 51	1	Music 65, 66	4	Music 67, 68	4
Music 31	1	English 2	3	Music 51	1	Music 51	1
English 1	3	Phys. Ed.	1	Music 240	1	Music 240	1
Phys. Ed.	1	Elective	1	Music 44-47	2	Music 44-47	2
Core C	4	Core C	4	Hist. 1-3	3	Hist. 1-3	3
				Elective	1		
	18		18		18		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2	Music 115	1	C&I 104	4
Music 100 or 103	1	Music 240	1	Music 240	1	C&I 187	4
Music151	3	Music 152	3	Music 248	2	C&I 188	4
Music 51	1	Music 51	1	Math. 21 or 22	2	C&I 287	4
Music 44-47	1	Music 44-47	2	English 35, 36 or 135, 136	3		
C&I 7	2	Ed. Psych. 106	3				
Ed. Psych. 105	3	Soc. Sci. 2	3	Sp. Com. 11 & 12 or 13 or 14, or Drama 50	3		
Soc. Sci. 1	3	English 35, 36, or 135, 136	3	Hlth. Ed. 102	2		
Math. 21, 22, or 15	2	Elective	1	Art 30	3		
				Elective	2		
	18		19		19		16

Total: 144 hr.

Accelerated Curriculums

Students wishing to complete any music curriculum in less than four years may, with the approval of the adviser and the Division Chairperson, accelerate their program by attending summer sessions. All requirements of the four-year curriculum must be satisfied.

Combined Applied-Music Education Curriculum

An optional program can be arranged for students who desire to meet the requirements of majors in both Applied Music and Music Education. Admission

to this program is by written consent of the Chairperson of Applied Music and the Chairperson of Music Education after the student has completed two semesters. This curriculum satisfies the course requirements of the Professional Certificate, Grades 1-12.

The numerous possible combinations of Applied Music with Music Education cannot be listed separately here. When the student becomes a candidate for this degree, his adviser designates the specific courses which must be taken to satisfy the requirements for both Applied Music and Music Education. By attending summer sessions, it may be possible to complete the combined curriculum in four years.

Courses of Instruction in Music

Music

19. *Introduction to Opera Theatre.* I, II. 0-4 hr., max. credit 16 hr. PR: Consent. Practical work in all aspects of lyric theatre production. Development of lyric theatre stage technique through movement studies, performance in major and minor roles and operatic scenes, and advanced production techniques.

30. *Appreciation of Music.* I, II. 3 hr. Introductory course designed to develop an appreciation and understanding of the significance of music as a fine art, and to help the student develop intelligent listening habits. (Not open to music majors.)

31. *Introduction to Music Listening.* I. 1 hr. Guided listening to important works from all historical periods with emphasis upon the development of awareness of stylistic traits, such as harmonic idiom, melodic structure, tonal movement, texture, rhythm, etc. For music majors only.

33. *Music Literature.* I. 2 hr. PR: Music 31 or consent. Vocal literature, solo and choral, with emphasis on the historical development of style. Course centered on familiarity with a selected repertory of works presented in historical context.

34. *Music Literature.* II. 3 hr. PR: Music 31 or consent. A course similar to Music 33 but devoted to instrumental music. Concentration on music after 1700.

41. *Music As an Art and Science.* I, II. 2 hr. Fundamental music skills and knowledge for elementary classroom teachers. Course includes a piano laboratory arranged. (Not open to music majors.)

42. *Music Materials and Procedures.* I, II. 2 hr. PR: Music 30 or equiv. and Music 41. Methods and materials for elementary classroom teachers. Course includes a piano laboratory arranged. (Not open to music majors.)

44. *Woodwind Instrument Pedagogy.* I, II. 1-2 hr. Techniques of teaching woodwind instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance and repair. May be repeated once for credit.

45. *Brass Instrument Pedagogy.* I, II. 1-2 hr. Techniques of teaching brass instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance and repair. May be repeated once for credit.

46. *String Instrument Pedagogy.* I, II. 1-2 hr. Techniques of teaching string instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance and repair. May be repeated once for credit.

47. *Percussion Instrument Pedagogy.* I, II. 1 hr. Techniques of teaching percussion instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance and repair.

48. *Instrumental Pedagogy.* I, II. 3 hr. Techniques of teaching band and orchestra instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance and repair. For Vocal Emphasis majors only.

49. *Vocal Pedagogy.* I, II. 2 hr. PR: Two semesters of voice study. Techniques of voice culture, applicable to school choral activities and instruction of young singers.

51. *Conducting and Rehearsing.* I, II. 1 hr. Practical experience in conducting and rehearsing choral and instrumental performance groups similar to those found in the public schools. May be repeated for credit.

61. *Aural Theory.* I, II. 2 hr. The four aural theory courses (Music 61, 63, 65, and 67) form a unit of instruction devoted to the development of aural skills such as sightsinging, melodic and harmonic dictation, identification of chords, chord progressions, modulations and non-harmonic tones. Each student works independently with recorded, programmed material.

62. *Written Theory.* I, II. 2 hr. Elementary theory (scales, keys, intervals) and introduction to diatonic harmony (part-writing and analysis).

63. *Aural Theory.* I, II. 2 hr. PR: Music 61. Continuation of Music 61.

64. *Written Theory.* I, II. 2 hr. PR: Music 62. Continuation of Music 62. Diatonic harmony including part-writing, harmonization of melodies, and harmonic analysis with triads, dominant seventh chords and non-harmonic tones.

65. *Aural Theory.* I, II. 2 hr. PR: Music 63. Continuation of Music 63.

66. *Written Theory.* I, II. 2 hr. PR: Music 64. Continuation of Music 64. Diatonic and chromatic harmony including part-writing, harmonization of melodies and harmonic analysis with seventh chords, modulations and foreign chords.

67. *Aural Theory.* I, II. 2 hr. PR: Music 65. Continuation of Music 65.

68. *Analysis of Music.* I, II. 2 hr. PR: Music 66. Consideration of melody, rhythm, harmony, texture, form, etc., and how these function to produce an organic work of art.

100. *Band.* I, II. 0 to 1 hr. Wind Ensemble, Concert Band, and Marching Band.

102. *University Choral Union.* I, II. 0 to 1 hr.

103. *University-Community Symphony Orchestra.* I, II. 0 to 1 hr.

105. *University Choir.* I, II. 0 to 1 hr.

110. *Applied Music.* I, II. 0-4. Open to qualified students in any field. Course may be repeated as many times as necessary or desirable. Credit given at the following rates:

    1. For music major, 2 hours for each 30-minute weekly lesson.
    2. For other students, a maximum of one 30-minute lesson per week for one hour of credit.
    3. Students in lower grade levels of Applied Music may be grouped in small classes for initial instruction. 1-2 hr. credit.

113. *Diction for Singers.* I, II. 2 hr. PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in English, Italian, Latin, Spanish, German, and French. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered. May be repeated for credit; max. credit 8 hours.

115. *Chamber Music.* I, II. 0 to 1 hr. PR: Consent. Opportunity to perform in small ensembles. May be repeated for credit.

118. *Methods and Pedagogy in Major and Applied Fields.* I. 1 hr. PR: Music 110.

119. *Methods and Pedagogy in Major and Applied Fields.* II. 1 hr. PR: Music 118.

151. *Music Education.* I. 3 hr. PR: Music 51. Methods, materials, and administration of elementary and secondary music programs. A weekly laboratory session arranged.

152. *Music Education.* II. 3 hr. PR: Music 151. Continuation of Music 151 including some opportunities for specialization in the student's primary interest. A weekly laboratory session will be arranged.

160. *Composition.* I, II. 2 hr. PR: Music 68 or consent. Creative writing. Course may be repeated for credit. Max. credit 8 hr.

171. *Instrumentation.* I. 2 hr. PR: Music 64. Study of characteristics of band and orchestral instruments and their use in scoring.

172. *Orchestration and Band Arranging.* II. 2 hr. PR: Music 171. Problems in scoring for orchestra ensembles and band.

174. *Choral Arranging.* II. 2 hr. PR: Music 64. Study of characteristics and problems in scoring for choral combinations.

218. *Repertoire.* I. 0-2 hr.

219. *Repertoire.* II. 0-2 hr.

230. *Music of Africa.* I, II. 3 hr. Traditional music of selected areas of Africa south of the Sahara with particular reference to East Africa. The diverse musical cultures with emphasis on historical background, instruments, ensembles, forms, styles, and music in its social context.

231. *History of Music.* I. 3 hr. Survey of music history from pre-Christian era to the baroque.

232. *History of Music.* II. 3 hr. Survey of music history from the baroque to the contemporary period.

240. *Clinic Chorus, Band, and Orchestra.* I, II. 1 hr. Experience in selection, preparation, and class performance of music appropriate for high school choral and instrumental groups. Students who have completed four semesters of Music 51 will prepare, teach, and conduct class performances.

245. *Marching Band Techniques.* I. 2 hr. PR: One semester college marching band experience or consent. Study and practical application of techniques of planning and preparation of school marching band performances.

248. *Music Arranging for Public School Groups.* I, II. 2 hr. PR: Music 66. Practical experience in techniques of making simple, workable arrangements of music for public school choral and instrumental performance groups.

260. *Upper-Division Composition.* 2 hr. PR: Four semesters Music 160, or consent based on scores submitted. Creative writing with emphasis on practical composition for performance. May be repeated for credit.

263. *Counterpoint.* I. 2 hr. PR: Music 68 or consent. Sixteenth century counterpoint.

264. *Counterpoint.* II. 2 hr. PR: Music 68 or consent. Eighteenth century counterpoint.

265. *Analysis of Musical Form.* I. 3 hr. PR: Music 68 or consent. Detailed study of structure of music.

266. *Major Project in Theory, Composition, or Music History.* 2 hr. PR: Music 68.

267. *Electronic Music.* I. 2 hr. PR: Music 68 and consent. Technology of producing electronic music. A study of the methods of producing electronic compositions, relationship between sound signal and sound perceived, ear training, analysis of examples from electronic music literature, and composition of electronic music.

268. *Electronic Music.* II. 2 hr. PR: Music 267. Continuation of Music 267.

299. *Recital.* I, II. 0-2 hr. Not available for graduate credit. To be used to fulfill applied major graduation requirement only when student has achieved Grade Level 9. Students who have reached Level 6 may receive 1 hour credit, which may not be used to fulfill graduation recital requirement.

330. *Survey of Vocal Music.* I. 3 hr. PR: Music 33-34 or equiv. and consent. Survey of masses, oratorios, cantatas, and operas from late Renaissance to the twentieth century. Solo repertoire will not be included.

331. *Survey of Instrumental Music.* II. 3 hr. PR: Music 33-34 or equiv. and consent. Survey of instrumental ensemble music, chamber music, concertos, symphonies and other orchestral music from late Renaissance to twentieth century. Solo repertoire will not be included.

332. *Studies in Contemporary Music.* I. 3 hr. PR: Music 33-34.

334. *Collegium Musicum.* I, II. 1-2 hr. Performance of outstanding musical works not in the standard repertory. Although open as a performance group to upperclassmen, graduate students will select appropriate vocal and instrumental music, investigate modes of performance, prepare any necessary editions, and direct rehearsals under supervision. May be repeated for credit.

340. *Band, Orchestra, Opera Theatre, and Music Education Clinics.* 1-2 hr. Special problems of organization and development of various performing organizations. Lecture, laboratory, and discussion groups.

341. *Music in the Elementary School.* I, II. 3 hr. PR: Music 30, 41, 42, or equiv. Development of skills, procedures, techniques, and materials used by general classroom teacher of music in grades K-8. (Not open to music majors.)

342. *The Teaching of Music Appreciation.* 3 hr. PR: Music 30, 41, 42, or equiv. Review of information, materials, sources, and techniques involved in teaching appreciation of music in public schools. (Not open to music majors.)

343. *Contemporary Techniques in Classroom Music.* 3 hr. PR: Music 152 or consent. Principles and practice of contemporary techniques in elementary and junior high school classroom music, including those of Orff and Kodaly.

344. *Appalachian Music for the Classroom.* II. 3 hr. Lecture, demonstration, and practical experience in performance of Appalachian vocal and instrumental music, and in use of this music in public school classrooms. May involve field trips, and construction of inexpensive instruments.

346. *Music in the Junior High School.* 2 hr. PR: Music 151-152 or equiv. Consideration of the potentialities and special needs of the junior high school in music education; programs, procedures, and materials.

Division of Art

Each student entering the Division of Art is encouraged to become a member of a community of creative artists formed by the faculty and student body of the Division. The structure of the curricula is such that the art student is offered an opportunity to explore many of the important fields of visual arts. Close relationships between art students and the faculty are maintained so that students are afforded the opportunity of sharing in the creative insights and personal works of a staff of professional artists and scholars.

Undergraduate programs in art are concentrated upon the idea of giving a full range of scholarly and studio experience to potential artists and teachers.

The Bachelor of Fine Arts or Bachelor of Arts degree is conferred upon any student who satisfies all departmental and entrance requirements, completes the appropriate curriculum, and complies with the general regulations of the University concerning degrees.

A candidate for a degree in the Division of Art must establish a minimum average of 2.0 (C) grade points per semester hour. In addition, he may be asked to present a portfolio of selected works for examination and evaluation by a faculty committee. The committee is empowered to make recommendations regarding the student's continuing work toward a degree in art. All art majors are required to purchase some personal equipment and expendable supplies.

Transfer students must establish transfer credit from other institutions during the first semester in which they are enrolled in the Division of Art.

Bachelor of Fine Arts Curriculum

In this curriculum students are given preparation in the following basic disciplines: drawing, design, art history, painting, sculpture, ceramics, graphic design, and printmaking. Students completing this program are prepared to work as professional artists in the visual arts. In addition, graduates with this background may prepare for careers in a wide range of cultural, commercial and industrial activities.

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Art 11	3	Art 12	3	Art 113	3	Art 114	3
Art 105	3	Art 106	3	Art 123	3	Art 124	3
Art 121	3	Art 122	3	Art 126	3	Art 127	3
English 1	3	English 2	3	Core B	3	Art elective	3
Phys. Ed.	1	Phys. Ed.	1	Core C	4	Core B	3
Core C	4	Core C	4				
	17		17		16		15

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Art 117	3	Art 118	3	Art 200 Level		Art 200 Level	
Art 130	3	Art 131	3	Studio	6	Studio	6
Art 140	3	Art 141	3	Art 211	3	Art 212	3
Art 250	3	Art 260	3	Art elective	3	Art elective	3
Core B	3	Core A	3	Art elective	3	Art elective	3
		Core B	3				
	15		18		15		15

Total: 128 hr.

The 12 hours of 200-level studio courses in the Fourth Year must represent a single area of concentration: painting, sculpture, printmaking, or graphic design.

Bachelor of Art — Art Education Curriculums

The student who wishes to prepare for teaching in the public schools should choose one of the following curriculums. To qualify for teaching art in the elementary through the senior high school, the student should complete the Art Education Single Comprehensive curriculum, grades 1-12. To qualify for teaching art and a second field in the junior and senior high school, the student should complete the Art Education curriculum, grades 7-12.

ART EDUCATION CURRICULUM — GRADES 1-12

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Art 11	3	Art 12	3	Art 113	3	Art 114	3
Art 105	3	Art 106	3	Art 126	3	Art 127	3
Art 121	3	Art 122	3	Art 130	3	Art 140	3
English 1	3	English 2	3	C&I 7	2	Music 30	3
Phys. Ed.	1	Phys. Ed.	1	Hist. 1-3	3	Hist. 1-3	3
Core C	4	Core C	4	Sp. Com 11 & 12 or 13 or 14, or Drama 50	3	Art elective	3
	17		17		17		18

THIRD YEAR				FOURTH YEAR*			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Art 117	3	Art 118	3	C&I 104	4	Art 211	3
Art 165	3	Art 166	3	C&I 187	4	Art 250 or 260	3
English 35, 36 or 135, 136	3	English 35, 36 or 135, 136	3	C&I 188	4	Art (Adv. Studio elect.)	3
Soc. Sci. 1	3	Soc. Sci. 2	3	C&I 287	4	Hlth. Ed. 101 or 102	2
Math 21 & 22 or 15	2	Math. 22 or 15	2			Elective (CAC)	3
Ed. Psych. 105	3	Ed. Psych. 106	3				
	17		17		16		14

Total: 133 hr.

ART EDUCATION CURRICULUM — Grades 7-12
First teaching field — Art
Second teaching field — English**

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Art 11	3	Art 12	3	Art 113	3	Art 114	3
Art 105	3	Art 106	3	Art 126	3	Art 127	3
Art 121	3	Art 122	3	Sp. Com. 11 & 12 or 13 or 14, or Drama 50	3	English 25	3
English 1	3	English 2	3			English 111	3
Phys. Ed.	1	Phys. Ed.	1	Hist. 1-3	3	Hist. 1-3	3
Core C	4	Core C	4	English 24	3	Math. 21, 22 or 15	2
				Hist. 1-3	3	C&I 7	2
				Math 21, 22 or 15	2		
	17		17		17		19

*The sequence of the two senior semesters may be reversed.
**Art Education majors, grades 7-12 may qualify for a second teaching field other than English.

THIRD YEAR				FOURTH YEAR*			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Art 130	3	Art 140	3	English 150	3	C&I 104	4
Art 166	3	Art elective	3	Art 250 or 260	3	C&I 188	8
English 121	3	English 122	3	English 263, 264, 265, or 267	3	C&I 287	4
English 131, 220, 235, 266, 280, or 286	3	English 250, 251, 255, 256, 261, or 262	3	English 125, 234, or 236, or Humanities 150 or 151	3		
Soc. Sci. 1	3	Soc. Sci. 2	3	Music 30	3		
Ed. Psych. 105	3	Ed. Psych. 106	3	Hlth. Ed. 102	2		
	18		18		17		16

Total: 139 hr.

*The sequence of the two senior semesters may be reversed.

Courses of Instruction

Art

3. *Materials and Procedures.* I, II. 3 hr. For Elementary Education majors, a course designed to familiarize the student with two- and three-dimensional media processes and concepts.

11. *Drawing.* I. 3 hr. Basic principles of drawing.

12. *Drawing.* II. 3 hr. PR: Art 11. Continuation of Art 11.

30. *Appreciation of Fine Arts.* I, II. 3 hr. Study of outstanding works of art from times past as well as from the present day: (1) materials with which the artist works, (2) sources of the art impulse, and (3) relationship of art to the civilization producing it.

105. *Survey of Art.* I. 3 hr. History of art from pre-historic times to Renaissance.

106. *Survey of Art.* II. 3 hr. PR: Art 105. History of art from Renaissance to present.

113. *Painting.* I. 3 hr. PR: Art 12, 121. Various concepts and media.

114. *Painting.* II. 3 hr. PR: Art 113 or equiv. Continuation of Art 113.

117. *Painting.* I. 3 hr. PR: Art 114 or equiv. Problems of concepts and media.

118. *Painting.* II. 3 hr. PR: Art 117 or equiv. Continuation of Art 117.

121. *Fundamentals of Design.* I. 3 hr. Visual perception, composition, manipulation of materials, and exploration of two-dimensional formal elements.

122. *Fundamentals of Design.* II. 3 hr. PR: Art 121. Continuation of Art 121. Three-dimensional formal elements.

123. *Graphic Design.* I. 3 hr. PR: Art 12, 121 or equiv. Basic tools, materials, and principles utilized within the graphic design profession.

124. *Graphic Design.* II. 3 hr. PR: Art 123 or equiv. Continuation of Art 123.

126. *Modeling-Sculpture.* I. 3 hr. PR: Art 12, 122 or equiv. Fundamentals of sculptural concepts, techniques, and materials.

127. *Modeling-Sculpture.* II. 3 hr. PR: Art 126 or equiv. Continuation of Art 126.

130. *Printmaking.* I. 3 hr. PR: Art 12, 122 or equiv. Processes of printmaking.

131. *Printmaking.* II. 3 hr. PR: Art 130 or equiv. Continuation of Art 130.

140. *Ceramics.* I. 3 hr. PR: Art 122, 126 or equiv. Fundamental ceramic concepts, techniques, and materials.

141. *Ceramics.* II. 3 hr. PR: Art 140 or equiv. Continuation of Art 140 developing advanced concepts and techniques.

151. *Special Problems.* I, II, S. 1-6 hr. PR: Consent. Primarily for Art majors. May be repeated for credit.

165. *Art Education in the Elementary School.* I. 3 hr. PR: Art 11, 121 or equiv.

166. *Art Education in the Secondary School.* II. 3 hr. PR: Art 11, 121 or equiv.

211. *Figure Drawing.* I, II. 3 hr. PR: Art 12, 122 or equiv. Drawing course in compositional structure from the figure.

212. *Advanced Drawing.* I, II. 3 hr. PR: Art 211 or equiv. Advanced tutorial drawing course.

213. *Painting.* I, II. 3-6 hr. PR: Art 118 or equiv. Advanced course concentrating on concepts, techniques, and media. May be repeated for credit.

223. *Graphic Design.* I, II. 3-6 hr. PR: Art 124 or equiv. Advanced course concentrating on concepts, techniques, and media. May be repeated for credit.

226. *Sculpture.* I, II. 3-6 hr. PR: Art 127 or equiv. Advanced course concentrating on concepts, techniques, and media. May be repeated for credit.

230. *Printmaking.* I, II. 3-6 hr. PR: Art 131 or equiv. Advanced course concentrating on concepts, techniques, and media. May be repeated for credit.

250. *Art History Before 1900.* I. 3 hr. PR: Art 106 or equiv. Significant developments in art up to 1900.

260. *Art History After 1900.* II. 3 hr. PR: Art 106 or equiv. Significant developments in art from 1900 to present.

310. *Painting.* I, II. 3-9 hr. PR: 12 hr. painting or equiv. Independent studio work with interdisciplinary critiques. May be repeated for credit.

320. *Printmaking.* I, II. 3-9 hr. PR: 12 hr. printmaking or equiv. Independent studio work with interdisciplinary critiques. May be repeated for credit.

326. *Sculpture.* I, II. 3-9 hr. PR: 12 hr. sculpture or equiv. Independent studio work with interdisciplinary critiques. May be repeated for credit.

Division of Drama

The WVU Division of Drama offers a professional program of theatre preparation for the student seeking artistic development for a career in theatre or in other fields where theatre skills are desirable. The four-year study leading to the Bachelor of Fine Arts (B.F.A.) degree is nationally recognized for its heavy emphasis on artistic development.

Courses in all areas of theatre are offered on the basic concept of providing formal classes for content and theory combined with practical application and experience in the laboratory. The 80 to 100 play productions in five different theatre areas present the student with numerous opportunities to develop his own personal abilities. The diversified program in oral interpretation gives each student an opportunity to attain a high level of achievement in oral expression.

The Creative Arts Center is one of the finest facilities in the nation for drama and includes some of the most modern equipment available for theatre experience and study. Productions represent a wide range within the dramatic repertoire including childrens' plays and puppetry.

The drama curriculum provides the drama major with an emphasis on a special area of theatre and supplies a wide, professional scope of total theatre environment so that each student will have a sound, well-rounded knowledge of theatre art. Graduates of the division are working in the professional theatre, radio, television, and in motion pictures. Many graduates have chosen careers in costume design, commercial sales work, make-up, department store style shows, lighting design, and similar areas in which theatre skills provide a unique advantage. The student interested in preparing for a career in drama will realize that here is one of the distinctive theatre programs in the nation.

University Theatre. The division produces, under the name University Theatre, a complete season of faculty directed play productions. The season is open to the public under regular theatre management procedures with box office facilities offering the sale of season and reserved seat tickets.

Studio Theatre. The division maintains separate facilities for the production of new and unusual plays, and for classical and experimental works which may not find exposure on the commercial stage. The studio program provides a training ground for actors, writers, directors, designers, and technicians. Plays in this theatre are directed by faculty or advanced students and are

open or closed to the general public, depending on the purpose of the production.

One-Act Play Productions. A regular laboratory performance schedule is maintained for student directed and acted one-act plays. During the academic year as many as sixty productions are performed before student audiences.

Oral Interpretation. Students enrolled in oral interpretation courses offer individual and group recitals in regularly scheduled performances open to the public. A wide range of special programs are also offered to civic, religious and other organizations, including radio and television appearances.

Children and Puppet Theatre. Theatre majors operate a complete puppet theatre program offering plays and productions for children. The Creative Arts Center operates a puppet-mobile project which tours in the state.

National Collegiate Players. The division sponsors a chapter of the national drama fraternity.

Bachelor of Fine Arts in Drama

The B.F.A. is conferred upon any student who complies with the general regulations of the University concerning degrees, satisfies all entrance and divisional requirements, and completes one of the curriculums of the Division of Drama with a 2.0 (C) grade-point average.

A. Acting-Directing-Oral Interpretation
B. Design and Technical Theatre
C. Acting-Voice
D. General Theatre

For admission to the junior year in the Division of Drama, a student must have established a 2.0 (C) grade-point average.

Transfer students must establish transfer credit from other institutions during the first semester in which they are enrolled in the Division of Drama. Those electing the Acting-Voice Curriculum must arrange an audition in the summer or fall prior to commencing work in the program.

Students are responsible for correctly fulfilling all requirements. Each student should review his course requirements both before and after every registration period so that errors or omissions will be detected immediately.

Teacher Certification

Certification in Drama is a part of the combined Speech-Drama teacher-preparation program in the College of Arts and Sciences.

Drama Curriculums

The applied program provides a drama student with a very complete experience in all of the basic theatre skills and crafts. In addition to the general scope of the program, the student may select an area of specialization in acting-directing-oral interpretation, acting-voice, design and technical theatre, or general theatre.

ACTING-DIRECTING-ORAL INTERPRETATION

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Drama 51	3	Drama 50	3
Drama 75	3	Drama 76	1
Drama 185	3	Drama 101	3
Drama 100	3	Art 30	3
English 1	3	English 2	3
Phys. Ed. 25 or Dance 17	1	Phys. Ed. 25 or Dance 17	1
		Core C	4
	16		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Drama 102/160 or Drama 104/160	6	Drama 104/160 or Drama 102/160	6
Drama 150 or 110	3	Drama 110 or 150	3
Drama 175	3	Drama 176	1
Core B	3	Music 30	3
Core C	3	Core C	4
	18		17

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Drama 161	3	Drama 103	3
Drama 180	3	Drama 161	3
Drama 250 or 281	3	Drama 200 level	3
Drama 275	3	Drama 276	1
Drama 285	3	Drama 280	3
Core B	3	Drama 281 or 250	3
	18		16

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Drama 200 level	3	Drama 200 level	3
Drama 260	3	Drama 251	3
Core B	6	Drama 260	3
Electives	6	Electives	9
	18		18

Total: 139 hr.

ACTING-VOICE

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Drama 75	3	Drama 76	1
Drama 185	3	Drama 100	3
Music 61, 62	4	Drama 101	3
Music 110*	2	Music 63, 64	4
Music 110*	1	Music 110*	2
English 1	3	Music 110*	1
Phys. Ed. 25 or Dance 17	1	English 2	3
		Phys. Ed. 25 or Dance 17	1
	17		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Drama 51	3	Drama 50	3
Drama 102/160 or Drama 104/160	6	Drama 104/160 or Drama 102/160	6
Drama 175	3	Drama 176	1
Music 110*	2	Music 110*	2
Music 110*	1	Music 110*	1
Core B	3	Core C	4
	18		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Drama 180/161 or Drama 103/161	6	Drama 103/161 or Drama 180/161	6	Drama 260	3	Drama 260	3
Drama 150 or 110	3	Drama 110 or 150	3	Drama 200 level**	6	Drama 280	3
Drama 275	3	Drama 276	1	Music 110*	2	Music 110*	2
Drama 285	3	Core B	3	Art 30	3	Music 19	2
Music 110*	2	Core C	3	Core B	3	Core B	3
		Music 110*	2			Core C	4
	17		18		17		17

Total: 139 hr.

*Students must attain a voice Level of 7 and piano Level of 2B.
**Choice of courses depends upon which option the student is following. This will be determined in counsel with the adviser.

DESIGN-TECHNICAL THEATRE

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Drama 100	3	Drama 101	3	Drama 51	3	Drama 50	3
Drama 185	3	Art 12	3	Drama 75	3	Drama 103	3
Art 11	3	Art 122	3	Drama 102	3	Drama 104	3
Art 121	3	English 2	3	Drama 110	3	Drama 160	3
English 1	3	Phys. Ed. 2	1	Drama 160	3	Core C	4
Phys. Ed. 1	1	Core C	4	Art 113	3		
	16		17		18		16

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Drama 161	3	Drama 161	3	Drama 200 level	6	Drama 200 level	6
Drama 200 level	3	Drama 180	3	Drama 260	3	Drama 260	3
Drama 203	3	Drama 202	3	Core B	3	Core B	3
Drama 285	3	Drama 204	3	Electives	6	Electives	6
Music 30	3	Core B	3				
Core B	3	Core C	3				
	18		18		18		18

Total: 139 hr.

It is recommended that 12 credit hours of free electives be in areas other than drama.

Fourth-year students will have the opportunity to design productions and do some technical theatre direction under faculty supervision (Drama 260).

GENERAL THEATRE

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Drama 51	3	Drama 50	3	Drama 102/160 or		Drama 104/160 or	
Drama 75	3	Drama 101	3	Drama 104/160	6	Drama 100/160	6
Drama 100	3	English 2	3	Drama 150 or		Drama 110 or	
Drama 185	3	Phys. Ed. 2	1	110	3	150	3
English 1	3	Core B	3	Core B	3	Music 30	3
Phys. Ed. 1	1	Core C	4	Core C	4	Core B	3
						Core C	3
	16		17		16		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Drama 180/161 or		Art 30	3	Drama 200 level	6	Drama 200 level	6
Drama 103/161	6	Drama 103/161		Drama 260	3	Drama 260	3
Drama 200 level	3	Drama 180/161	6	Electives	9	Electives	9
Drama 285	3	Drama 200 level	3				
Core B	3	Elective	3				
English 150	3						
	18		18		18		18

Total: 139 hr.

Students in this option may not select Drama 176, 276, or 251.

It is recommended that 18 credits of free electives be in areas other than drama courses. Subjects in art, music, speech, or other areas outside the Division of Drama should be considered.

Courses of Instruction in Drama

Drama

30. *Appreciation of Drama.* I, II. 3 hr. Course designed to develop an appreciation and understanding of drama as a fine art. Open to all students.

50. *Oral Interpretation.* I, II. 3 hr. Development of mental and emotional responsiveness to written materials. Techniques of communicating through oral reading. Open to all students.

51. *Vocal Techniques in Acting.* I. 3 hr. Emphasis on vocal development and voice training for actors.

75. *Acting.* I, II. 3 hr. Basic theories and concepts in stage acting for beginning student. Emphasis on the physical, intellectual, emotional and personality languages of acting. Open to all students.

76. *Actors Studio.* II. 1 hr. PR: Drama 75 or consent. Laboratory experience in movement, physical control, and pantomime for the actor.

100. *Stagecraft.* I, II. 3 hr. Lecture course in elementary problems of scenery construction, scene painting, and stage lighting.

101. *Theatre Workshop.* I, II. 1-3 hr. Laboratory for producing University plays and informal stimulation of interest in creative arts. Open to all students.

102. *Scene Design.* I, II. 3 hr. Problems of creating stage settings. Consideration of styles of production. Practice in techniques of scene design.

103. *Theatre Lighting Design.* I, II. 3 hr. Basic techniques in stage lighting. Practical experience on University Theatre lighting crews.

104. *History and Design of Costumes.* I, II. 3 hr. Survey of historical stage costuming with basic design including rendering techniques of costumes for the stage.

110. *Theatre Makeup.* I, II. 3 hr. Lecture-laboratory courses in art of stage makeup. Practical makeup for University Theatre productions.

150. *Advanced Oral Interpretation.* I, II. 3 hr. PR: Drama 50. Content and form of types of literature, and advanced techniques for oral presentation.

160. *Theatre Performance and Rehearsal Laboratory.* I, II. 1 to 6 hr. PR: Consent. Participation in assigned theatre projects. Appreciation of creativity and performance techniques in theatre. Majors only. Max. credit 6 hr.

161. *Theatre Performance and Rehearsal Laboratory.* I, II. 1 to 6 hr. PR: Drama 160 or consent. Participation in assigned theatre projects. Appreciation of creativity and performance techniques in theatre. Majors only. Max. credit 6 hr.

175. *Intermediate Acting.* I. 3 hr. PR: Drama 75 or consent. Continuation of acting theories and concepts. Emphasis on character portrayal theories.

176. *Actors Studio.* II. 1 hr. PR: Drama 76, 175 or consent. Laboratory experience in character portrayal and acting techniques through the use of staged scenes.

179. *Directed Theatre Activities.* I, II. 0 to 4 hr. PR: Consent. Assigned theatre projects, supervised by faculty. Max. credit in any one semester, 3 hr.

180. *Directing.* I, II. 3 hr. Fundamentals of directing stage plays. Emphasis on work of director in relation to actor, stage, business, composition, movement, and rehearsal schedule.

185. *History of the Theatre.* I. 3 hr. Examination of major periods of theatre history through study of important playwrights of each era.

202. *Advanced Scene Design.* II. 3 hr. PR: Drama 100 and 102, or consent. Lecture and laboratory in theories of scene design for stage and television, including actual construction of designs. Open to juniors, seniors, and graduate students.

203. *Advanced Theatre Lighting Design.* I. 3 hr. PR: Drama 103 or consent. Advanced theories of lighting and design for the stage. Practical experience with advanced lighting equipment.

204. *Advanced Costume Design.* II. 3 hr. PR: Drama 104 or consent. Individual study in design styles and techniques. Survey of costume design in theatre today.

250. *Advanced Problems in Interpretation.* I. 3 hr. PR: Drama 50 and consent. Deals with individual problems of advanced students in interpretation.

251. *Professional Reading.* II. 3 hr. PR: Consent. Intensive training in interpretation. Designed to meet needs of the individual. Full-length public recital prepared and presented. Limited enrollment.

252. *Art of Storytelling.* S. 3 hr. PR: Consent. Principles involved in effective presentation of stories, with practical experience in classroom and before audiences. Stories of all types for adults and children studied.

260. *Theatre Performance and Rehearsal Laboratory.* I, II. 3 to 6 hr. PR: Drama 161 or consent. Participation in assigned theatre projects. Appreciation of creativity and performance techniques in theatre. Majors only. Max. credit, 6 hr.

275. *Advanced Acting.* I. 3 hr. PR: Drama 75 and consent. Advanced theories in acting to include script and style analysis, modern and historical.

276. *Actors Studio.* II. 1 hr. PR: Drama 76, 176, 275, or consent. Advanced laboratory experience in acting and production styles of historical and modern theatre through the use of staged scenes.

280. *Advanced Play Directing.* II. 3 hr. PR: Drama 180 or consent. Emphasis on work of director as an integrating artist. High level of proficiency in direction of a one-act play required of all students enrolled.

281. *Theatre Dialects.* I, II. 3 hr. PR: Consent. Study and mastery of fifteen common dialects used in theatre, motion pictures, and television.

282. *Creative Dramatics.* I, II, S. 3 hr. PR: Drama 75 or consent. Study and practice of creative dramatic activity as a method of learning and self-development for children.

284. *Puppetry.* I. 3 hr. PR: Drama 75 or consent. Comprehensive survey of construction and manipulation techniques of puppets. An evaluation of the role of puppetry in child behavior and therapy techniques.

285. *Advanced History of Theatre.* I. 3 hr. Historical survey of theatre from primitive times to present. Includes both oriental and occidental theatres.

286. *Drama Criticism and Aesthetics.* II. 3 hr. Survey of chief critical and aesthetic theories of drama — ancient, modern, and contemporary.

290. *Playwriting.* II. 3 hr. PR: Consent. Development of creative ability in dramatic composition. Techniques and problems of playwriting. Of cultural value, but primarily a writing course.

375. *Styles of Acting and Directing.* II. 3 hr. PR: Drama 180 and 280, or consent. Extensive and intensive study of acting and directing styles.

School of Dentistry

Dental Hygiene Program

Dental Hygiene is a Division of the School of Dentistry.* The program is unique in that students are admitted as beginning freshmen and complete four years in dental hygiene. The curriculum combines liberal arts and dental hygiene subjects each semester. The curriculum has received full accreditation by the Council on Dental Education of the American Dental Association. Upon completion of all requirements, and with the recommendation of the School of Dentistry, the candidate is awarded a Bachelor of Science degree in Dental Hygiene.

A dental hygienist is a licensed member of the dental health team whose responsibilities include dental health education and under the supervision of the dentist, professional services for patients, and auxiliary duties. A dental hygienist may be employed by a private dental office, public school system, state or local health department, hospital, dental hygiene school, government, or industry. The specific responsibilities of the dental hygienist vary with the type of position and state laws. Because of the shortage of health personnel, the profession offers an interesting career opportunity to students willing to accept the challenges of an expanding profession.

Admission

The general admission policies of WVU are followed. The applicant must be a graduate of an accredited high school or preparatory school and have completed one unit of algebra, one unit of geometry, and four units of English. High school chemistry and biology are strongly recommended. High school applicants should be in the upper one-third of their graduating class.

Transfer students are accepted only on a space available basis. A transfer student, with one or more years of college desiring a degree in Dental Hygiene from WVU, is usually required to be in residence six semesters and carry a full load of credit hours. The most advantageous time for transfer is following the freshman year. Transfer students must have a minimum academic average of 2.0 or above (on a 4.0 scale) and must have completed 8 semester hours of college chemistry before entrance.

High school students are expected to take the American College Testing Program examination. A high school counselor or principal can supply information concerning this examination. The Dental Hygiene Aptitude Test is required of every applicant. A pamphlet, with detailed information and instructions about this test, may be obtained by writing the Director of Dental Hygiene, WVU Medical Center, Morgantown, WV 25606, or American Dental Hygienists' Association, 211 East Chicago Avenue, Chicago, IL 60611.

The applicant's personal qualifications, scholastic record, aptitude test scores, and recommendations are reviewed by the Dental Hygiene Admissions Committee. After reviewing these credentials, the committee may request an

*Complete information concerning the School of Dentistry professional program (D.D.S.) may be obtained in the WVU *Graduate Catalog*.

interview with the applicant. If this is the case, the applicant is notified by letter of the date, time, and place of the interview interview.

The applicant should write to the Director of Dental Hygiene, WVU Medical Center, or the Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, requesting the required admission forms. Applicants should apply as early as possible in the year preceding the year admission is desired. Applications are available by September 30th and enrollment normally closes by March 1st (flexible).

Promotion

At the close of the school year, the status of each student is reviewed by the Dean of School of Dentistry and the Director of Dental Hygiene. They may take any of the following actions: a student may be promoted unconditionally; may be promoted on probation; may be allowed to make up deficiencies in an accredited summer school; may be given the opportunity to repeat a year; or, may be suspended from further studies in the School of Dentistry.

Unconditional promotion normally depends upon the fulfillment of all course requirements, and the attainment of certain minimum standards of academic achievement. These requirements provide for a minimum grade-point average of 1.5 for promotion to the sophomore year; a cumulative grade-point average of 1.75 for promotion to the junior year; a cumulative grade-point average of 2.0 for promotion to the senior year; and a cumulative grade-point average of 2.0 for graduation.

Professional Organizations

The American Dental Hygienists' Association is the official organization representing the dental hygiene profession. Student dental hygienists have the opportunity of junior membership in the association.

Sigma Phi Alpha is the national dental hygiene honorary society.

Student Scholarships and Loans

The American Dental Hygienists' Association (ADHA) administers dental hygiene student scholarships from funds provided by the American Fund for Dental Education and The Educational Trust Fund of the American Dental Hygienists' Association. The amount of the scholarship award varies with the recipient's financial need. To be eligible to apply for an ADHA scholarship a candidate must make application the year preceding the final year of the curriculum and have a minimum cumulative college grade-point average of 2.5.

The West Virginia Dental Hygienists' Association Scholarship. This scholarship was established in 1969. The scholarship recipient is chosen from among the students entering their first clinical semester. The dental hygiene faculty selects the recipient on the basis of previous academic achievement, personal integrity, and financial need. The student must be a West Virginia resident. Students need not apply to be considered for the scholarship; however, those desiring additional information concerning the scholarship should contact the Director of Dental Hygiene.

The West Virginia State Dental Auxiliary Award. In 1963, a scholarship award was founded for a second-semester junior dental hygiene student. This award was originally sponsored by Mrs. Marian Nicholson Kaiser and is perpetuated by the Woman's Auxiliary to the West Virginia Dental Association. The

recipient is selected for her academic accomplishments and professional potential in dental hygiene.

Jane Gunnet Memorial Scholarship. In 1970, friends of Miss Jane Gunnet, a graduate of the Division of Dental Hygiene, established a scholarship fund in her memory. The scholarship is awarded annually. The recipient is chosen by the dental hygiene faculty on the basis of scholastic achievement.

Phyllis Preston Memorial Fund. This fund was established by the Woman's Auxiliary to the Huntington Dental Society in memory of a former member of their auxiliary. Monies are awarded in the form of scholarships to dental hygiene students.

Dental Hygiene Revolving Loan Fund. The fund was established by the Woman's Auxiliary to the Wheeling District Dental Society. The loan is administered by WVU Financial Aids Office. Any dental hygiene student from West Virginia, with a 2.0 average, may apply. Repayment is required within a year following graduation or termination of enrollment in the Division of Dental Hygiene.

General Funds. General University scholarships and loans are available to undergraduate students through the Financial Aids Office. Students interested in financial assistance should contact Neil Bolyard, Financial Aids Office, Mountainlair, West Virginia University, Morgantown, WV 26506.

DENTAL HYGIENE CURRICULUM PLAN

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
English 1	3	English 2	3	S.A. 1, 5, or 7	3	Physiol. 141	4
Biol. 1	4	Biol. 2	4	Sp. Com. 11	1	Psych. 164	3
Chem. 11	4	Chem. 12	4	Sp. Com. 14	2	Microbiol. 26	3
D. Hyg. 1	2	D. Hyg. 2	2	D. Hyg. 110	3	Anat. 109	3
Phys. Ed. 1	1	D. Hyg. 66	1	Anat. 101	4	D. Hyg. 170	1
Psych. 1	3	Phys. Ed. 2	1	Core A elective	3	Core A elective	3
		Core A elective	3				
	17		18		16		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
S.A. 122, 140, or 231	3	Ed. Psych. 260	3	D. Hyg. 150*	2	D. Hyg. 156	5
Ed. Psych. 105	3	D. Hyg. 126	3	D. Hyg. 155	5	D. Hyg. 161	5
D. Hyg. 125	3	D. Hyg. 135	3	D. Hyg. 159	2	D. Hyg 163	1
Path. 128	3	Pharmacol. 160	3	D. Hyg. 160	2	D. Hyg. 164	1
D. Hyg. 132	2	NTR. 71	3	D. Hyg. 168	1	D. Hyg. 172	2
Elective	3	Dent. 300	1	Elective	3	D. Hyg. 174	1
				Elective	3	Elective	3
	17		16		18		15

*Field experiences for this course are scheduled during the first semester and second semester. Final credit for the course is given at the end of the second semester.

Courses of Instruction in Dental Hygiene

Nancy V. Ramsey, *Co-ordinator;* Assistant Professor Anne W. Shoaf; Instructors Carolyn Miller, Mary Lynn Snider, and Mary Beiswenger.

Courses included in the dental hygiene curriculum but not listed here will be found either under other department listings in this *Catalog* or under the Basic Sciences or Dentistry sections of the *Graduate Catalog.*

D. Hyg.

1. *Dental Hygiene.* I. 2 hr. Orientation. Historical development of dentistry and dental hygiene.

2. *Dental Hygiene.* II. 2 hr. Orientation. Scope of service, literature, education, ethics, professional organization, licensure, and opportunities in dental hygiene.

66. *Technical Expression and Dental Literature.* II. 1 hr. Preparation and uses of professional communication.

109. *Oral Histology.* II. 3 hr. Histological structure of the teeth and tissues of the oral cavity and the morphological development of these structures.

110. *Oral Anatomy.* I. 3 hr. Human teeth and the anatomy of head and neck with emphasis on structures in or related to the oral cavity.

125. *Dental Hygiene Technics.* I. 3 hr. Fundamental principles and technics of dental hygiene through lectures, laboratory, and clinical participation.

126. *Clinical Dental Hygiene.* II. 3 hr. Lectures and clinical application of dental hygiene principles and technics.

132. *Oral Roentgenology.* I. 2 hr. Basic principles and procedures in roentgenographic technics and radiographic interpretations.

135. *Dental Materials.* II. 3 hr. General composition and properties of dental restorative materials as related to clinical practice of dental hygiene. Emphasis on manipulation and technical uses.

150. *Dental Health Education.* I and II. 2 hr. Lectures, demonstrations, and field experiences on the methods, materials, and resources used in teaching of dental health to various population groups.

155. *Clinical Dental Hygiene.* I. 5 hr. A weekly class period is devoted to lectures and demonstrations of techniques related to the expanded functions of the dental hygienist. Students continue to gain clinical experience treating patients in the dental hygiene clinic.

156. *Advanced Clinical Dental Hygiene.* II. 5 hr. Continuation of D. Hyg. 155.

159. *Oral Surgery and Anesthesiology.* I. 2 hr. Basic principles and procedures of oral surgery as related to the role of the dental hygienist.

160. *Dental Hygiene Seminar.* I. 2 hr. Diversified lectures to broaden the student's knowledge of the dental specialties.

161. *Dental Hygiene Seminar.* II. 2 hr. Continuation of D. Hyg. 160 including information on current trends and advances in dentistry.

163. *Ethics and Jurisprudence.* II. 1 hr. Ethical and legal obligations of the dental hygienist to the patient, community, and profession.

164. *Economics and Practice Administration.* II. 1 hr. Principles of public relations and general office management.

168. *Periodontics.* I. 1 hr. Tissues of the periodontium, histopathology of periodontal disease with emphasis on etiology, examinations, diagnosis, treatment, and prevention within the scope of dental hygiene.

170. *Dental Nursing Technics.* II. 1 hr. Emergency first aid and principles of nursing applicable to the dental office.

172. *Public Health.* II. 2 hr. Theory and practice of preventive dentistry and community health.

174. *Dental Hygiene Teaching Methods.* II. 1 hr. Concepts and principles of administration, curriculum, and clinical teaching unique to dental auxiliary education. Emphasis on overall role of the dental hygiene educator.

College of Engineering

Engineering is the profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways of economically utilizing the materials and forces of nature for the benefit of mankind.

The western world, and especially the United States, often has been characterized as a technological society. This phrase reflects the great impact that engineering has had on western society. Forecasts of the expected state of the world by the year 2000 suggest that large-scale systems will be created for the development, control, and use of our natural resources and that development will continue in automated manufacturing, synthetic foods, rapid transportation systems, space programs, defense systems, and biosocial systems having to do with medical advances, housing, community development, and pollution control. Engineering will play the major role.

Society's needs in the decades ahead will demand engineering talent on a scale never before seen. The engineer will be called upon, not only to create, but to coordinate technological advances more effectively into large-scale social systems such as vast metropolitan complexes.

The College's programs are administered through seven departments: Aerospace, Agricultural, Chemical, Civil, Electrical, Industrial, and Mechanical Engineering and Mechanics. Its undergraduate programs are recognized by industry as ranking with the best in the nation. The curricula have been planned to give the student a balanced background in the basic sciences, engineering sciences, engineering analysis, humanistic-social studies, and engineering synthesis and design. This blend of science and practice has been designed to give the student the tools to solve today's problems and the background to develop the expertise needed for the future.

To assist the student in his education as a professional engineer, the College staff uses modern teaching techniques, including programmed material, guest lectures by visiting authorities, seminars, team project assignments, and other techniques to provide a breadth of experience.

Teaching laboratories are equipped with modern instruments, machines, and tools to improve and enrich the student's understanding of engineering principles and problems. Both analog and digital computer laboratories are available for classroom work.

Graduate programs, dedicated to the development of engineering practice, engineering science, and research, are offered in numerous creative specialties. Both master's and doctor's degrees are offered. These exciting programs, where the frontiers of knowledge are explored through study and research, provide an academic environment in which all programs — undergraduate and graduate — are updated constantly to give the student the professional education needed in a technological-scientific society.

ECPD Accreditation

The Engineer's Council for Professional Development (ECPD), a joint body concerned with the enhancement of the status of the engineer and the engineering profession, has been designated by its constituent bodies (American Society of Civil Engineers, American Institute of Mining, Metallurgical, and Petroleum Engineers, American Society of Mechanical Engineers, Institute of Electrical and Electronics Engineers, American Society for Engineering Education, Ameri-

can Institute of Chemical Engineers, American Institute of Aeronautics and Astronautics, National Council of State Boards of Engineering Examiners, American Institute of Industrial Engineering, and the Engineering Institute of Canada) as the co-ordinating agency for accrediting undergraduate engineering curricula in the United States.

The undergraduate curricula of the College of Engineering are accredited by the ECPD.

Faculty

Chester A. Arents, P.E., M.E. (U. Ore.), *Dean of the College of Engineering.*
George W. Weaver, P.E., M.S.M.E. (WVU), *Assistant Dean of the College of Engineering.*

Engineering Experiment Station — Administration

Chester A. Arents, P.E., M.E. (U. Ore.), *Director.*
William R. Boyle, P.E., Ph.D. (WVU), *Assistant Director.*
Richard P. Smith, B.S.J. (WVU), *Assistant to the Director*
Edward F. Byars, P.E., Ph.D. (U. Ill.), *Professor and Chairperson of Mechanical Engineering and Mechanics.*
Walton W. Cannon, Ph.D. (U. Ill.), *Professor and Chairperson of Electrical Engineering.*
Samy E. G. Elias, Ph.D. (Okla. St. U.), *Professor and Chairperson of Industrial Engineering.*
Jerome B. Fanucci, Ph.D. (Penn. St. U.), *Professor and Chairperson of Aerospace Engineering.*
Emory L. Kemp, P.E., Ph.D. (U. Ill.), *Professor and Chairperson of Civil Engineering.*
Alfred D. Longhouse, P.E., Ph.D. (Cornell U.), *Professor and Chairperson of Agricultural Engineering.*
Chin-Yung Wen, Ph.D. (WVU), *Professor and Chairperson of Chemical Engineering.*

Aerospace Engineering

Jerome B. Fanucci, Ph.D. (Penn. St. U.), *Professor and Chairperson of Aerospace Engineering.*
Jonathan M. Bennett, *Flight Instructor in Aerospace Engineering.*
Alvin D. Howell, Ph.D. (WVU), *Assistant Professor of Aerospace Engineering.*
John L. Loth, Ph.D. (U. Toronto), *Professor of Aerospace Engineering and Director of Propulsion Laboratory.*
Ellis E. Mood, *Flight Instructor in Aerospace Engineering.*
Nathan Ness, Ph.D. (Brooklyn Poly, Inst.), *Professor of Aerospace Engineering.*
William Squire, M.A. (U. Buffalo), *Professor of Aerospace Engineering.*
Richard E. Walters, Ph.D. (WVU), *Associate Professor of Aerospace Engineering and Director of Aerodynamics Laboratory.*
Syed Yusuff, Ph.D. (Brooklyn Poly. Inst.), *Professor of Aerospace Engineering.*

Agricultural Engineering

A. D. Longhouse, P.E., Ph.D. (Cornell U.), *Professor and Chairperson of Agricultural Engineering.*
Waldo E. Bell, B.S.Ag.E. (Penn. St. U.), *Assistant Professor of Agricultural Engineering and State Extension Agricultural Engineering Specialist (Retired).*

Cleveland I. Biller, M.S.E. (WVU), *Lecturer in Forest Engineering.* (Research Mechanical Engineer, USDA, Forest Service, Forestry Sciences Laboratory, Morgantown).

Edmond B. Collins, M.S.Ag.E. (WVU), *Associate Professor of Agricultural Engineering and Extension Specialist — Agricultural Engineering.*

Robert G. Diener, Ph.D. (Mich. St. U.), *Associate Professor of Agricultural Engineering.*

Kendall C. Elliott, M.S.Ag.E. (WVU), *Assistant Professor of Agricultural Engineering.*

Roy E. Emerson, M.S. (Cornell U.), *Associate Professor of Agricultural Engineering.*

Harry G. Gibson, M.S.E. (WVU), *Adjunct Assistant Professor of Agricultural Engineering.* (Project Leader, Forest Engineering Research, USDA, Forest Service, Forestry Sciences Laboratory, Morgantown).

Leonard R. Johnson, M.S. (Mont. St. U.), *Adjunct Assistant Professor of Forest Engineering,* (Research Industrial Engineer, USDA, Forest Service, Forestry Sciences Laboratory, Morgantown).

Ross A. Phillips, M.S.E. (WVU), *Adjunct Assistant Professor of Forest Engineering.* (Research Mechanical Engineer, USDA, Forest Service, Forestry Sciences Laboratory, Morgantown).

Arthur W. Selders, M.S.Ag.E. (U. Mass.), *Associate Professor of Agricultural Engineering and Extension Specialist — Agricultural Engineering.*

Robert O. Weedfall, M.S.E. (WVU), *Adjunct Assistant Professor of Agricultural Engineering.*

Chemical Engineering

Chin-Yung Wen, Ph.D. (WVU), *Professor and Chairperson of Chemical Engineering.*

Richard C. Bailie, Ph.D. (Iowa St. U.), *Professor of Chemical Engineering.*

George L. Blackshaw, Ph.D. (N. C. St. U.), *Professor of Chemical Engineering.*

William R. Boyle, P.E., Ph.D. (WVU), *Professor of Chemical Engineering and Assistant Director of Engineering Experiment Station.*

Harold V. Fairbanks, P.E., M.S.Ch.E. (Mich. St. U.), *Professor of Chemical Engineering.*

Alfred F. Galli, P.E., M.S.Ch.E. (WVU), *Associate Professor of Chemical Engineering.*

Joseph D. Henry, Jr., Ph.D. (U. Mich.), *Assistant Professor of Chemical Engineering.*

Marian W. Jones, M.S.J. (WVU), *Lecturer (part-time) in Chemical Engineering.*

Sidney Katell, B.S. (NYU), *Adjunct Associate Professor (part-time) of Chemical Engineering.*

Walter A. Koehler, P.E., Ph.D. (U. Wisc.), *Professor and Director Emeritus.*

William J. McMichael, Ph.D. (Rice U.), *Lecturer in Chemical Engineering.*

Duane G. Nichols, Ph.D. (U. Del.), *Lecturer in Chemical Engineering.*

Alfred W. Pappano, Ph.D. (WVU), *Assistant Professor of Chemical Engineering.*

John T. Sears, Ph.D. (Princeton U.), *Assistant Professor of Chemical Engineering.*

Civil Engineering

Emory L. Kemp, P.E., Ph.D. (U. Ill.), *Professor and Chairperson of Civil Engineering.*

David A. Anderson, P.E., Ph.D. (Purdue U.), *Assistant Professor of Civil Engineering.*

Wilfred H. Baker, P.E., M.S.C.E. (Syracuse U.), *Professor Emeritus of Civil Engineering.*
Jerry C. Burchinal, P.E., M.S.C.E., (WVU), *Professor of Civil Engineering.*
Bernard F. Byrne, P.E., Ph.D. (U. Penn.), *Assistant Professor of Civil Engineering.*
Roland P. Davis, P.E., Ph.D. (Cornell U.), *Dean Emeritus, College of Engineering.*
Hota V.S. GangaRao, P.E., Ph.D. (N. C. St. U.), *Assistant Professor of Civil Engineering.*
Sumner B. Irish, P.E., M.S.C.E. (Columbia U.), *Visiting Professor of Civil Engineering.*
Charles R. Jenkins, Ph.D. (Okla. St. U.), *Professor of Environmental Engineering.*
Benjamin Linsky, P.E., M.S.E. (U. Mich.), *Professor of Environmental Engineering (Air Pollution).*
Larry D. Luttrell, P.E., Ph.D. (Cornell U.), *Associate Professor of Civil Engineering.*
Lyle K. Moulton, P.E., Ph.D. (WVU), *Associate Professor of Civil Engineering.*
Edward S. Neumann, Ph.D. (Northwestern U.), *Assistant Professor of Civil Engineering.*
William A. Sack, Ph.D. (Mich. St. U.), *Associate Professor of Civil Engineering.*
James W. Saunders, P.E., Ph.D. (WVU), *Assistant Professor of Civil Engineering.*
Roger K. Seals, Ph.D. (N. C. St. U.), *Associate Professor of Civil Engineering.*
D. Richard Sears, Ph.D. (Cornell U.), *Lecturer in Environmental Engineering.*
William J. Wilhelm, Ph.D. (N. C. St. U.), *Associate Professor of Civil Engineering.*
Raul Zaltzman, P.E., M.S.C.E. (U. Okla.), *Professor of Civil Engineering.*

Electrical Engineering

Walton W. Cannon, P.E., Ph.D. (U. Ill.), *Professor and Chairperson of Electrical Engineering.*
M. Dayne Aldridge, D.Sc. (U. Va.), *Associate Professor of Electrical Engineering.*
Constantine A. Balanis, Ph.D. (Ohio St. U.), *Associate Professor of Electrical Engineering.*
Edwin C. Barbe, M.S.E.E. (WVU), *Assistant Professor of Electrical Engineering.*
Jerry L. Boyles, M.S.E.E. (WVU), *Research Engineer in Electrical Engineering.*
Wils L. Cooley, Ph.D. (Carnegie Mellon U.), *Assistant Professor of Electrical Engineering.*
Everette C. Dubbe, P.E., B.S.E.E. (S. D. St. C.), *Associate Professor of Electrical Engineering.*
H. L. Huang, Ph.D. (VPI), *Adjunct Assistant Professor of Electrical Engineering.*
Edwin C. Jones, P.E., M.S.E.E. (U. Ill.), *Professor Emeritus of Electrical Engineering.*
T. W. Keech, Jr., M.S.E.E. (WVU), *Instructor in Electrical Engineering.*
Mason M. Peterson, P.E., B.S.E.E. (Ohio North. U.), *Associate Professor Emeritus of Electrical Engineering.*
Nelson S. Smith, Jr., P.E., Ph.D. (Ill. Tech.), *Associate Professor of Electrical Engineering.*
Robert E. Swartwout, Ph.D. (U. Ill.), *Professor of Electrical Engineering.*
Subrahmanyam S. Venkata, Ph.D. (U. S. C.), *Assistant Professor of Electrical Engineering.*
Richard W. Young, M.S.E.E. (WVU), *Instructor in Electrical Engineering.*

Industrial Engineering

Samy E. G. Elias, Ph.D. (Okla. St. U.), *Professor and Chairperson of Industrial Engineering.*
Theodore C. Barker, B.S.I.E. (WVU), *Research Engineer in Industrial Engineering.*

Steven R. Borbash, Ph.D. (U. Pitt.), *Associate Professor of Industrial Engineering.*
Vergil B. Clark, M.S. (U. Tenn.), *Lecturer in Industrial Engineering, and Director, Physical Plant.*
Jack Byrd, Jr., Ph.D. (WVU), *Assistant Professor of Industrial Engineering.*
James O. Denny, M.L. (U. Pitt.), *Professor of Industrial Engineering.*
Robert D. Fowler, P.E., M.S.I.E. (Ga. Tech.), *Professor of Industrial Engineering.*
Donald L. Gochenour, Jr., Ph.D. (WVU), *Instructor in Industrial Engineering.*
Max L. Hailey, Ph.D. (Tex. Tech. U.), *Assistant Professor of Industrial Engineering.*
Arup K. Mallik, Ph.D. (N. C. St. U.), *Visiting Assistant Professor of Industrial Engineering.*
Ralph W. Plummer, Ph.D. (WVU), *Assistant Professor of Industrial Engineering.*
Cooper N. Redwine, Ph.D. (UCLA), *Assistant Professor of Industrial Engineering.*
Richard E. Ward, P.E., M.S.I.E. (WVU), *Research Engineer in Industrial Engineering.*

Mechanical Engineering and Mechanics

Edward F. Byars, P.E., Ph.D. (U. Ill.), *Professor and Chairperson of Mechanical Engineering and Mechanics.*
Sunder H. Advani, Ph.D. (Stanford U.), *Associate Professor of Mechanical Engineering and Mechanics.*
Richard A. Bajura, Ph.D. (U. N. Dame), *Assistant Professor of Mechanical Engineering and Mechanics.*
Howard W. Butler, P.E., Ph.D. (Yale U.), *Professor of Mechanical Engineering and Mechanics.*
Carl H. Cather, P.E., M.S.M.E. (U. Ill.), *Professor Emeritus.*
Harold M. Cather, P.E., M.E., M.S.M.E. (WVU), *Professor Emeritus.*
Hasan T. Gencsoy, P.E., M.S.M.E. (WVU), *Professor of Mechanical Engineering and Mechanics.*
William A. Grisson, Ph.D. (U. Cincinnati), *Assistant Professor of Mechanical Engineering and Mechanics.*
Russell R. Haynes, P.E., Ph.D. (WVU), *Associate Professor of Mechanical Engineering and Mechanics.*
Gordon R. Hopkins, P.E., Ph.D. (U. Ala.), *Associate Professor of Mechanical Engineering and Mechanics.*
David E. McKee, P.E., Ph.D. (WVU), *Lecturer in Mechanical Engineering and Mechanics.*
Charles A. Moffatt, P.E., Ph.D. (Tulane U.), *Associate Professor of Mechanical Engineering and Mechanics.*
In-Meei Neou, Ph.D. (Stanford U.), *Professor of Mechanical Engineering and Mechanics.*
Helen L. Plants, P.E., M.S.C.E. (WVU), *Professor of Mechanical Engineering and Mechanics.*
William R. Powell, Ph.D. (Stanford U.), *Assistant Professor of Mechanical Engineering and Mechanics.*
Sidney H. Schwartz, Ph.D. (U. So. Calif.), *Associate Professor of Mechanical Engineering and Mechanics.*
Robert D. Slonneger, P.E., M.S.M.E. (U. Tex.), *Professor of Mechanical Engineering and Mechanics.*
John E. Sneckenberger, Ph.D. (WVU), *Assistant Professor of Mechanical Engineering and Mechanics.*

Robert D. Snyder, Ph.D. (WVU), *Professor of Mechanical Engineering and Mechanics.*
Emil J. Steinhardt, Ph.D. (U. Pitt.), *Associate Professor of Mechanical Engineering and Mechanics.*
Wallace S. Venable, D.Ed. (WVU), *Lecturer in Mechanical Engineering and Mechanics.*
George W. Weaver, P.E., M.S.M.E. (WVU), *Professor of Mechanical Engineering and Mechanics.*
Donald T. Worrell, P.E., M.S.E. (WVU), *Professor of Mechanical Engineering and Mechanics.*

Freshman Program

Charles E. Wales, P.E., Ph.D. (Purdue U.), *Professor of Engineering and Education, and Director of Freshman Program.*
Edmond B. Collins, B.S., M.S. (WVU), *Associate Professor of Engineering and Extension Specialist.*
Thomas R. Long, B.S., M.S., (WVU), *Lecturer.*

Admission

For admission to the College of Engineering, prospective students must be qualified for admission to WVU, present credit for 2 units of algebra and 1 unit of geometry, and 1/2 unit of trigonometry or advanced mathematics. Students who do not meet these requirements in mathematics may apply for admission as pre-engineering students in the College of Engineering. All applications should be sent to the Office of Admissions and Records, WVU, Morgantown, WV 26506.

Students desiring to transfer from another college, school, or university into the College of Engineering must meet the following requirements:

(A). Have a grade-point average of 2.0 or higher for all college level courses.

(B). Have a grade-point average of 2.0 or higher for all mathematics courses.

Complete information concerning WVU admission, registration, fees and expenses, regulations, etc. may be obtained in Part 2 of this *Catalog.*

Requirements for Degrees

Any student, to be eligible to receive a bachelor's degree in any branch of engineering for which degrees are offered, in addition to satisfying all entrance requirements, shall be required to complete satisfactorily the number of semester hours of work as specified in the curriculum of the department leading to the degree for which the student is a candidate, plus the general requirements of physical education and English proficiency by WVU for such a degree.

A grade of C or better must be attained in each mathematics course before registration in a subsequent mathematics course is allowed.

College of Engineering Curricula

The curricula are set up to give, in the first two years, a well-rounded training in the basic sciences of mathematics, chemistry, and physics, and in English. This is followed by such technical subjects as mechanics, thermodynamics, and electricity. The degree of emphasis varies somewhat with the curriculum followed. These courses bridge the gap between the pure sciences and the professional courses. In addition, courses in the humanities are given throughout the four years.

In the third and fourth years, special emphasis is placed on the professional work of the engineer. In these years a certain number of credit hours are available for electives.

The curricula lead to:

1. The degree of Bachelor of Science in Aerospace Engineering.
2. The degree of Bachelor of Science in Agricultural Engineering.
3. The degree of Bachelor of Science in Chemical Engineering.
4. The degree of Bachelor of Science in Civil Engineering.
5. The degree of Bachelor of Science in Electrical Engineering.
6. The degree of Bachelor of Science in Industrial Engineering.
7. The degree of Bachelor of Science in Mechanical Engineering.

Curriculum in Aerospace Engineering

Degree: Bachelor of Science in Aerospace Engineering

Aerospace engineering embraces the science and technology of high speed ground vehicles and vehicles not necessarily bound to the earth. This includes all types of aircraft, rockets, missiles, and spacecraft, whether flight takes place in the atmosphere, or beyond it.

The aerospace engineering curriculum includes the disciplines encountered in the design of all of these vehicles. The undergraduate student extensively studies the basic principles of fluid mechanics, structures, design, and experimentation, and thus becomes a versatile engineer upon graduation, competent to work in many areas of engineering. The curriculum may serve as a terminal program by incorporating design-oriented courses for the technical electives, or it may be used as a preparatory program for advanced study by the selection of science-oriented courses for these technical electives.

For those students who wish to pursue a career in medicine, dentistry, or related areas, but desire an aerospace engineering degree prior to entering the appropriate professional school, certain course substitutions may be made. These substitutions would include biology (8 hours) and organic chemistry (8 hours), to be substituted for 9 hours of technical electives and 3 hours of heat transfer. This selection will help the student satisfy admission requirements to the above-mentioned professional schools.

AEROSPACE ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
English 1	3	English 2	3	Physics 11	4	Physics 12	4
Engineering 1	3	Engineering 2	3	M.E.M. 51	4	M.E.M. 52	4
Chem. 15	4	Chem. 16	4	Speech Com. 11	3	A.E. 11	3
Phys. Ed. 1	1	Non-tech. elect.	3	Non-tech. elect.	3	Non-tech. elect.	3
		Phys. Ed. 2	1				
	18		18		18		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
A.E. 111	3	A.E. 112	4	A.E. 100	Cr.	A.E . 120	3
A.E. 160	3	A.E. 140	3	A.E. 115	3	M.E.M. 250	3
M.E.M. 140	3	A.E. 161	3	A.E. 150	3	Technical elect.	6
E.E. 105	4	E.E. 106	4	A.E. 165	2	Non-tech. elect.	3
Non-tech. elect.	3	Non-tech. elect.	3	Math. elect.	3		
				Technical elect.	3		
				Non-tech. elect.	3		
	16		17		17		15

Non-technical elective Core Curriculum courses must consist of 9 hr. or Group A and 12 hr. of Group B, and at least two subjects in each group; 18 hr. must be core courses on the College of Engineering-approved list.
Two technical electives must be selected from aerospace engineering courses in the 200 or 300 series.

Curriculum in Agricultural Engineering

Degree: Bachelor of Science in Agricultural Engineering

Agricultural engineering is the application of engineering principles to agriculture. Success in the application of engineering fundamentals to the agricultural industry requires knowledge of both the biological and physical sciences. The purpose of the course is to give the student general training in agricultural and engineering fundamentals. Considerable stress is given to basic requirements of plant and animal life which affect engineering practices, but greater emphasis is placed on a thorough knowledge of those underlying principles and methods which are the foundation of all the engineering professions.

Although the curriculum gives limited opportunity for specialization, agricultural engineering is made up of five major fields. These are: power and machinery, structures and environment, soil and water conservation, electric power and processing, and food engineering.

AGRICULTURAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Biol. 1	4	Agron. 2	4
Engineering 1	3	Engineering 2	3	Math. 17	4	Math. 18	4
English 1	3	English 2	3	Physics 11	4	Physics 12	4
Math. 15	4	Math. 16	4	M.E.M. 51	4	M.E.M. 52	4
Phys. Ed. 1	1	Phys. Ed. 2	1	Non-tech. elect.	3	Non-tech. elect.	3
		Non-tech. elect.	3				
	15		18		19		19

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Econ. 51	3	Ag.E. 201	3	Ag.E. 230	3	Ag.E. 210 or	
E.E. 105	4	Econ. 52	3	Ag.E. 240 or		220	3
M.E.M. 110	3	C.E. 115	3	250	3	Ag.E. 290 or	
M.E.M. 140	3	M.E.M. 112	3	Ag. Sci. elect.	3	260	3
Math. elect.	3	Non-tech. elect.	3	Non-tech. elect.	3	Non-tech. elect.	3
		C.E. 1	2	Technical elect.	3	Technical elect.	6
	16		17		15		15

Forest Engineering Option

Forest engineering is an option curriculum in agricultural engineering leading to the Bachelor of Science in Argicultural Engineering. This option is intended primarily to prepare engineers for forest production and harvesting industries and for research and development with industries manufacturing forest machinery and equipment. Forest engineering embraces recognition and solution of engineering problems associated with producing, harvesting, handling, and transporting primary forest products to the mill.

The curriculum includes courses in the biological and forestry sciences which enable the student to appreciate and understand the nature of the engineering problems in the forest industries. The curriculum provides some opportunity for specialization. Students interested in employment with companies manufacturing machinery and equipment for the forest industries should emphasize machine design and development. Students desiring employment with forest industries producing and harvesting logs and pulpwood should select elective courses in materials handling and related subjects. The curriculum permits graduates to select from a wide variety of employment opportunities. It contains sufficient depth in certain areas to prepare the student to pursue graduate training for an advanced degree. Industries and government agencies are placing increased emphasis on graduate-level training. Students who have an interest in engineering teaching and/or research should plan to continue their education at the graduate level.

FOREST ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
English 1	3	English 2	3	Biol. 1	4	F.M. 122	3
Chem. 15	4	Chem. 16	4	Physics 11	4	Physics 12	4
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
Engineering 1	3	Engineering 2	3	M.E.M. 51	4	M.E.M. 52	4
Phys. Ed. 1	1	Phys. Ed. 2	1	Non-tech. elect.	3	Non-tech. elect.	3
		Non-tech. elect.	3				
	15		18		19		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
M.E.M. 110	3	F.M. 12	3	C.E. 1	2	F.M. 230	3
M.E.M. 140	3	C.E. 115	3	F.M. 211	4	Math. elect.	3
Biol. 51	2	M.E.M. 112	3	F.M. 233	4	Non-tech. elect.	3
E.E. 105	4	W.S. 130	3	Non-tech. elect.	3	Technical elect.	3
Econ. 51	3	Econ. 52	3	M.E.M. 134	3	Ag.Eng. or For. Eng. elect.	e
Non-tech. elect.	3	Technical elect.	3	Ag.Eng. or For. Eng. elect.	3		
	18		18		19		15

*Technical electives must be upper-division engineerinourses including agricultural engineering and forest engineering. An exception is For. 226.

Curriculum in Chemical Engineering

Degree: Bachelor of Science in Chemical Engineering

The curriculum in chemical engineering has been developed to qualify graduates for positions in operation, development, design, construction, and management of manufacturing plants in which raw materials are subjected to chemical and physical changes to produce economically desirable products.

The first two years include English, basic mathematics through differential equations, chemistry, classical physics, and elementary mechanics. Courses in the humanities introduce the social-humanistic stem which continues throughout the remainder of the curriculum.

The third year includes organic chemistry and engineering sciences comprising chemical engineering fundamentals of momentum, mass and heat transfer, thermodynamics and reaction kinetics.

The fourth-year senior block introduces the student to the actual practice of chemical engineering including analysis, synthesis and design centered around a comprehensive plant design project, process dynamics, design of experiments, nature of materials, and professional practice and ethics. Associated with this block is a written and oral communications sequence. Sequences in the humanistic-social and technical electives continue in the senior year.

CHEMICAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
English 1	3	English 2	3	Physics 11	4	Physics 12	4
Engineering 1	3	Engineering 2	3	M.E.M. 51	4	M.E.M. 52	4
Chem. 15	4	Chem. 16	4	Non-tech. elect.	3	Non-tech. elect.	3
Phys. Ed. 1	1	Phys. Ed. 2	1	Ch.E. 40	2	Ch.E. 41	2
		Non-tech. elect.	3				
	15		18		17		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 133	3	Chem. 134	3	Chem. 143	3	Chem. 144	3
Chem. 135	1	Chem. 136	1	Elective	3	Elective	3
Electives	9	Electives	9	Senior Block		Senior Block	
Junior Block		Junior Block		Ch.E. 170	10	Ch.E. 171	10
Ch.E. 110	3	Ch.E. 111	3				
Ch.E. 142	3	Ch.E. 143	3				
	19		19		16		16

Electives in the junior and senior years must be selected to complete requirements of non-technical electives (24 hr.), technical electives (6 hr.) and a Math. elective or Ch.E. 231 (3 hr.).
A 2.0 grade-point average in required chemical engineering courses is necessary before a student can register in Ch.E. 170 or 171.

Curriculum in Civil Engineering

Degree: Bachelor of Science in Civil Engineering

The primary emphasis of the undergraduate program in Civil Engineering is to educate a professional engineer who will be expected to assume the role of problem solver, decisionmaker, and technical leader, and one whose educational background will undergird the continuing development required for practice during a forty-year career.

During the four-year program, civil engineering students are given a solid grounding in mathematics, physics, and chemistry to enable them to understand the fundamental principles of engineering. Added to this is extensive development of the fundamentals of environmental, soil and materials, structural, and transportation systems engineering. To help the student to understand his role in the community, to be effective in working in design teams involving other engineers and other professions, to be effective in leadership and decision making and to be effective as a spokesman, the curriculum attempts to give the student a meaningful educational experience in the humanities, English, and economics. Some specialization is available through electives in advanced courses in transportation, sanitary engineering, structures, soil mechanics, or photogrammetry and surveying, which are available in civil engineering or related departments.

A cooperative program with the State Department of Highways provides an opportunity for eligible students to combine formal education with practical experience.

CIVIL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
English 1	3	English 2	3	Physics 11	4	Physics 12	4
Engineering 1	3	Engineering 2	3	M.E.M. 51	4	M.E.M. 52	4
Chem. 15	4	Chem. 16	4	Geol. 1	3	Non-tech. elect.	3
Phys. Ed. 1	1	Phys. Ed. 2	1	Non-tech. elect.	3	C.E. 90	1
		Non-tech. elect.	3				
	15		18		18		16

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
C.E. 101	4	C.E. 120	4	C.E. 131	4	Tech. elect.	3
C.E. 110	4	C.E. 147	3	C.E. 146	3	C.E. 195	CR
C.E. 160	3	C.E. 169	3	C.E. 195	CR	C.E. 291	3
C.E. 195	CR	C.E. 180	4	C.E. 260	3	Eng. Sci. elect.	3
Econ. 52	3	C.E. 195	CR	Non-tech. elect.	3	Non-tech. elect.	9
I.E. 277	3	Eng. Sci. elect.	3	Tech. elect.	3		
	17		17		16		18

Non-technical electives must be selected to meet University Core Curriculum requirements and College of Engineering humanistic course requirements.
Technical electives must be approved by the Department of Civil Engineering and may be selected from the basic sciences, engineering science or engineering analysis area.
Engineering science electives are to be selected from: A.E. 111; Ag.E. 240; E.E. 105; M.E. 222; and either M.E.M. 101 or 140.

Curriculum in Electrical Engineering

Degree: Bachelor of Science in Electrical Engineering

The course in electrical engineering has been developed to give the student general training in engineering fundamentals and broad training in the field of electrical engineering. Special training is available in the following fields as electives in the senior year: electric power, communications, control, solid state electronics, microwaves, antennas, and computing systems.

In the first two years of electrical engineering, the work is limited for the most part to those subjects which are essential as preparatory courses for the more technical courses in the third and fourth years. During the second year, fundamental courses in electrical engineering are introduced. In the third and fourth years the curriculum is mainly courses in electrical engineering and electives.

The technical electives are scheduled in the curriculum to permit a student to acquire more depth in the student's preferred area of electrical engineering. Thus, electives normally will be selected from 200-level electrical engineering courses. However, the student's adviser may recommend, in some cases, that a student select technical electives from upper-level courses in mathematics, the sciences, or other areas of engineering as a part of the curriculum. Mathematics electives and engineering science electives are to be selected from department-approved lists.

Students enrolled in the Department of Electrical Engineering will not be permitted to register for any electrical engineering course until they have attained a grade of C or better in each of the electrical engineering courses which are prerequisite to that course. This rule is intended to insure that the student has mastered prerequisite material prior to advancing to more difficult material.

To be eligible for graduation in electrical engineering a student must attain a grade-point average of 2.0 or better for all electrical engineering courses at-

tempted except for those courses in which a grade of W or WU was received. This rule serves the purpose of assuring that the student has demonstrated overall competence in the chosen major.

ELECTRICAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	E.E. 20	3	E.E. 23	3
Engineering 1	3	Engineering 2	3	Math. 17	4	Math. 18	4
English 1	3	English 2	3	Physics 11	4	Physics 12	4
Math. 15	4	Math. 16	4	M.E.M. 51	4	M.E.M. 52	4
Phys. Ed. 1	1	Non-tech. elect.	3	Non-tech. elect.	3	Non-tech. elect.	3
		Phys. Ed. 2	1				
	15		18		18		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
E.E. 125	4	E.E. 126	3	E.E. 131	3	E.E. 218	3
E.E. 140	3	E.E. 130	3	E.E. 154	4	Eng'g. Sci. elect.	3
E.E. 150	3	E.E. 141	3	E.E. 200	0	Non-tech. elect.	6
Econ. 51	3	E.E. 152	4	Non-tech. elect.	3	Tech. elect.	6
Math. or Stat. elect.	3	Econ. 52	3	Tech. elect.	6		
	16		16		16		18

Curriculum in Industrial Engineering

Degree: Bachelor of Science in Industrial Engineering

Industrial Engineering began in the latter part of the nineteenth century through the efforts of such pioneers as Frederick Taylor and Frank and Lillian Gilbreth. The Gilbreths are best known as leading figures in the book and movie entitled *Cheaper by the Dozen*. These early industrial engineers were concerned with improving the effectiveness of manual industrial operations. They made remarkable savings possible through the use of motion and time studies and methods analysis. As industries became more complex large scale systems, industrial engineers became concerned with additional areas of concern to management. Industrial engineers became involved in the design of production facilities using plant layout procedures. They also were developing quality control plans which are so important today in providing for consumer protection in product purchases. As production processes became more complex, the industrial engineer became involved in examining the range of manufacturing processes necessary to produce a product and how these can be utilized most effectively. In the late fifties and the early sixties, the computer became a powerful new tool for use in solving management problems. Once the computer became economical, the industrial engineer became involved in using the computer to solve larger and more complex management problems through the use of such modern management science tools as operations research.

Today's students still learn the fundamental principles which were developed years ago; however, the industrial engineering student in the 1970's is increasingly more concerned with using the computer to solve industrial and social problems. At the same time, the industrial engineer has become even more involved with the human element of organization. The industrial engineering area known as human factors is concerned with the individual's health, safety,

limitations, and capabilities as these relate to his job and the working environment.

The industrial engineer graduating today has a versatile degree which can be used in every endeavor in our society. Since the industrial engineer is involved in the more effective management of organizations, he is not limited to any one industry. The industrial engineer is not even restricted to industry; many industrial engineers have found employment in such places as hospitals, farms, banks, retail stores, and virtually every governmental agency.

Industry has found that their managers must have a knowledge of both technical and management problems. The industrial engineer has an excellent blending of these two fields: technology and management. For this reason, the top management of many of our largest organizations are industrial engineers.

INDUSTRIAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
English 1	3	English 2	3	Physics 11	4	Physics 12	4
Engineering 1	3	Engineering 2	3	M.E.M. 51	4	M.E.M. 52	4
Chem. 15	4	Chem. 16	4	Non-tech. elect.	3	I.E. 140	3
Phys. Ed. 1	1	Non-tech. elect.	3	I.E. 20	3	Non-tech. elect.	3
		Phys. Ed. 2	1				
	15		18		18		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Econ. 51	3	Econ. 52	3	I.E. 250	3	M.E.M. 101	3
I.E. 213	3	E.E. 106	4	I.E. 277	3	I.E. 142	3
E.E. 105	4	I.E. 100	3	I.E. tech. elect.	6	I.E. tech. elect.	3
E.E. 281	3	Non-tech. elect.	3	I.E. 170	3	Non-tech. elect.	3
Non-tech. elect.	3	I.E. 214	3	Ch.E. 105	3	C.E. 115	3
	16		16		18		15

Non-technical electives must satisfy requirements for both Group A and B, Core Curriculum requirements.

Curriculum in Mechanical Engineering

Degree: Bachelor of Science in Mechanical Engineering

Mechanical Engineering is a profession in which its members work creatively to achieve practical results in terms of products and services that people need or want. In view of the wide range of products and services encompassed by mechanical engineering, it is not surprising that mechanical engineers find employment in a wide range of industries, as well as governmental agencies and educational institutions. It is thus very important that the mechanical engineering curriculum prepare students to deal effectively with a broad range of engineering problems, rather than narrow specialities.

Mechanical engineers, while strongly oriented toward science, are not scientists. They must deal with reality in all its aspects and must be competent to use classical as well as the most modern parts of science together with empirical knowledge and ingenuity to effectively practice their profession. The ability to make acceptable compromises between the often conflicting demands of scientific rigor and economic necessity, deadlines and perfection, high efficiency and reliability, requires the maturity of a highly educated mind. The curriculum in mechanical engineering is designed to prepare students to this end and may be

conveniently divided into four main parts, including courses in (a) mathematics, chemistry, physics, and English, which form the foundation of all engineering activity, (b) humanities and liberal studies which help to develop consciousness and a sense of proportion, (c) the engineering sciences which extend the basic sciences to practical levels, (d) professional engineering subjects which emphasize the professional approach to project engineering rather than the acquisition of specialized knowledge or skills.

While the undergraduate curriculum is sufficiently broad to permit the graduate to select from a wide variety of employment opportunities, at the same time it contains sufficient depth to prepare a student to enter graduate school to seek an advanced degree. As modern science and engineering become ever more complex, the desirability of graduate levels of preparation is being recognized by most advanced industries and government agencies. Students who develop an interest in engineering research or in academic teaching should plan to continue their education through the M.S. or Ph.D. level.

MECHANICAL ENGINEERING

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4
Engineering 1	3	Engineering 2	3
English 1	3	English 2	3
Math. 15	4	Math. 16	4
Phys. Ed. 1	1	Phys. Ed. 2	1
		Core	3
	15		18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Math. 17	4	Math. 18	4
Physics 11	4	Physics 12	4
M.E.M. 51	4	M.E.M. 52	4
M.E.M. 30	2	Core	3
Core	3	Core	3
	17		18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
E.E. 105	4	E.E. 106	4
M.E.M. 110	3	M.E.M. 112	3
M.E.M. 140	3	M.E.M. 141	3
M.E.M. 170	3	M.E.M. 144	3
Ch.E. 105	3	M.E.M. 180	3
	16		16

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
M.E.M. 134	3	M.E.M. 136	3
M.E.M. 182	2	Prof. elect.	6
M.E.M. 250	3	Core	3
Prof. elect.	3	Core	3
Core	6		
	17		15

The professional electives (9 hours) are selected by the student with the advice and approval of the adviser. The courses selected should form a clear and consistent pattern according to the career objectives of the student. Six of the professional elective credits must be selected from courses in the department.

The 24 credit hours of core must be selected from the WVU Core Curriculum with the approval of the adviser: Core A, 12 hours and Core B, 12 hours.

All students in mechanical engineering and mechanics will be required to pass an examination on manufacturing processes and machine tools prior to commencing the fourth year of studies. Information on the content and nature of this examination may be obtained from the student's adviser.

Special Engineering Curricula

Elective Groups for Students in Other Colleges

Candidates for degrees other than engineering degrees, and special students in any department of WVU, are permitted to elect subjects in the College of Engineering, provided, in each case, they have had the subjects specified as prerequisites. Students who wish to take a general classical or scientific course of study before taking the engineering curriculum are advised to carry their mathematics as far as called for by the engineering curriculum, and to take some elective work in the College of Engineering.

Partial Curriculum

Students who do not have the time or are otherwise unable to take the full curriculum will be allowed to take a special or partial curriculum, consisting of such studies as they are prepared to take, provided such curriculum shall have been approved by the adviser.

Professional Degrees

Aerospace Engineer (A.E.), Chemical Engineer (Ch.E.), Civil Engineer (C.E.), Electrical Engineer (E.E.), Mechanical Engineer (M.E.).

The professional degree is conferred by the College of Engineering on the basis of practical experience and study in absentia, the presentation of a thesis, and oral final examination. To be eligible, a candidate for a professional degree must have been in active practice of his profession for at least five years since receiving his first degree, and must have been in responsible charge of important work for at least two years. Application for registration as a candidate for a professional degree should be made not later than October 1 in the academic year in which the degree is desired. Regulations and registration forms may be obtained from the Dean of the College of Engineering.

Courses of Instruction in Engineering

Freshman Program

E.

1. *Freshman Engineering Design.* 3 hr. Introduction to the concepts of design (analysis, synthesis, evaluation), report writing, conservation of mass, conservation of energy, and calculation techniques. 2 hr. rec., 4 hr. lab.

2. *Freshman Engineering Design.* 3 hr. Continuation of Engineering 1, with extension of the concepts to new design problems, introduction of graphical communication, statics, and project experience in the department of their choice. 2 hr. rec., 4 hr. lab.

General Engineering

E.

111.* *Impact of Technology on Society.* 3 hr. Designed for non-technical students to give insight into the social relevance of technology and engineering in today's culture, this course deals with the broad interface of technology with modern society, with life essentials, communication, manufacturing, etc. Attitudes of scientists, engineers, and others compared.

325. *Ordinary Differential Equations in Engineering Analysis.* I. 3 hr. PR: Consent. Solution techniques for linear and non-linear ordinary differential equations in application to engineering problems. Emphasis on approximate and numerical methods including digital computer techniques. Iterative asymptotic and weighted-residual methods; the numerical solution of ordinary differential equations in engineering analysis.

Aerospace Engineering

A.E.

10. *Introduction to Aerospace Engineering I.* I. 2 hr. PR: Math. 15. Introduction to the use of digital computer methods for enigneering calculations. Preparation and execution of aerospace engineering oriented computer programs.

11. *Introduction to Aerospace Engineering II.* II. 2 hr. PR: A.E. 10.

100. *Inspection Trip.* (Credit). PR: Senior standing.

111.* *Fluid Dynamics I.* 3 hr. Coreq: Math. 18. Properties of the fluid medium, dimensional analysis, hydrostatics, kinematics and dynamics of a fluid field, perfect fluid flow about a body, complex potential function, thin airfoil theory, conformal transformation. 3 hr. lec.

112.* *Fluid Dynamics II.* 4 hr. PR: A.E. 111, M.E.M. 140. Finite wing theory. Compressible, nonviscous fluids isentropic flow, Prandtl-Meyer expansion, shock waves, airfoils in compressible flow, small perturbation theory, viscous effects. 4 hr. lec.

115. *Experimental Fluid Dynamics I.* 3 hr. PR: A.E. 112. Subsonic and supersonic wind tunnel testing methods and practice. Experiments include the following measurements: Pressure distribution of bodies, boundary layer determination, turbulence measurements, force tests, and stability and performance determinations. Corrections for scale and jet boundary effects. Test design, data analysis, and engineering report preparation. 3 hr. lec., 2 hr. lab.

120. *Flight Vehicle Design.* 3 hr. PR: A.E. 140. Preliminary design of flight vehicles with regard for performance and stability requirements, considering aerodynamics, weight and balance, structure arrangement, configuration, guidance, and propul-

*May be taken as undergraduate work by students in other colleges and schools.

sion effects. Layout drawings and calculations are combined in a preliminary design report. 1 hr. lec., 6 hr. lab.

140. *Flight Mechanics.* 3 hr. PR: A.E. 111. Fundamental concepts of aircraft static and dynamic stability and control. Derivation of general equations of unsteady aircraft motion. Use of aerodynamic transfer functions and automatic control systems introduced. 3 hr. lec.

150. *Flight Vehicle Propulsion.* 3 hr. PR: A.E. 112 or consent. Equilibrium combustion thermodynamics. Quasi one-dimensional flow with friction and total temperature change. Thermodynamics of aircraft engines. Aerodynamics of inlets, combustors, nozzles, compressors and turbines. Performance of rockets. Ideal rocket analysis. 3 hr. lec.

160. *Flight Vehicle Structures I.* 3 hr. PR: M.E.M. 52. Strength of thin walled structures in bending, shear, and torsion. Strain energy and application of Castigliano's theorem to bending of rings and curved bars, and to analysis of frames. Principle of virtual work and its application to beam and truss deflections and to statically indeterminate structures. 3 hr. lec.

161. *Flight Vehicle Structures II.* 3 hr. PR: A.E. 160. Tension fields and the design of Wagner beam. Buckling of compression structures; bars, sandwich columns, wrinkling in sandwich construction, plates, shells and stiffened panels. Design for minimum weight. Introduction to matrix methods of structural analysis. Failure by fatigue and fracture. 3 hr. lec.

165. *Experimental Flight Vehicle Structures.* 2 hr. PR: A.E. 160. Tension properties and stress-strain curves of materials. Strain gage circuitry. Elastic and inelastic column buckling testing and theoretical comparison. Structural dynamics testing of vibrating beams. Shear tests by torsion, and torsion of thin-walled members. Observation of photoelastic and Moire fringe pattern techniques, and an introduction to fatigue testing. 1 hr. lec., 3 hr. lab.

170. *Aviation Ground School.* 3 hr. Nomenclature of aircraft, aerodynamics, civil air regulations, navigation, meteorology, aircraft, and aircraft engines. May serve as preparation for private pilot written examinations. 2 hr. rec., 2 hr. lab.

215. *Experimental Fluid Dynamics II.* 3 hr. PR: A.E. 115. Continuation of A.E. 115 with increased emphasis on dynamic measurements. Shock tube/tunnel and subsonic and supersonic measurements. Experiments include optical techniques, heat transfer to models, and viscous flow measurements. Error analysis of test data. 2 hr. lec., 3 hr. lab.

216. *Applied Aerodynamics.* 3 hr. PR: A.E. 140. Chordwise and spanwise airload distribution for plain wings, wings with aerodynamic and geometric twist, wings with deflected flaps, and wings with ailerons deflected. Section induced drag characteristics. 3 hr. lec.

220. *Guided Missile Systems.* 3 hr. PR: A.E. 112 and/or conc: A.E. 150. Design philosophy according to mission requirements. Preliminary configuration and design concepts. Aerodynamic effects on missiles during launch and flight. Ballistic missile trajectories. Stability determination by analog simulation. Performance determination by digital and analog simulation. Control, guidance, and propulsion systems. Operational and reliability considerations. 3 hr. lec.

232. *V/STOL Aerodynamics.* 3 hr. PR: A.E. 112. Fundamental aerodynamics of V/STOL aircraft. Topics include propeller and rotor theory, helicopter performance, jet flaps, ducted fans, and propeller-wing combinations. 3 hr. lec.

234. *Fluid Dynamics III.* 3 hr. PR: A.E. 112. Fundamentals of viscous flow and the Navier-Stokes equation; incompressible laminar flow in tubes and boundary layers; transition from laminar to turbulent flow; incompressible turbulent flow in tubes and boundary layers. 3 hr. lec.

235. *Fluid Dynamics IV.* 3 hr. PR: A.E. 112. One-dimensional non-steady gas-dynamics. Shock tube theory and applications. Fundamentals of supersonic and hypersonic flow and determination of minimum drag bodies. 3 hr. lec.

242. *Flight Testing.* 3 hr. PR: A.E. 140. Applied flight test techniques and instrumentation, calibration methods, determination of static performance characteristics, and introduction to stability and control testing based on flight test of Cessna Super Skywagon airplane. Flight test data analysis and report preparation. 1 hr. lec., 6 hr. lab.

249.* *Space Mechanics.* 3 hr. PR: Math. 18, M.E.M. 51. Flight in and beyond the earth's atmosphere by space vehicles. Laws of Kepler and Orbital theory. Energy requirements for satellite and interplanetary travel. Exit from and entry into an atmosphere. 3 hr. rec.

250. *Advanced Topics in Propulsion.* 3 hr. PR: A.E. 150 or consent. Special problems of thermodynamics and dynamics of aircraft power plants. Chemical rocket propellants and combustion. Rocket thrust chambers and nozzle heat transfer. Nuclear rockets. Electrical rocket propulsion. 3 hr. lec.

260. *Design of Flight Structures I.* 3 hr. PR: A.E. 161. Structural design and analysis of flight vehicle members. Layout and detail design of specified components are required. 1 hr. lec., 6 hr. lab.

265. *Aeroelasticity.* 3 hr. PR: A.E. 160. Vibrating systems of single degree and multiple degrees of freedom, flutter theory and modes of vibration, torsional divergence and control reversal. 3 hr. lec.

280. *Aerospace Problems.* 1-6 hr. Upper division and graduate.

285. *Thesis.* 2-6 hr. PR: Senior standing and consent.

291. *Introduction to Research.* 1-3 hr. PR: Senior standing and consent. Methods of organizing theoretical and experimental research. Formulation of problems, project planning, and research proposal preparation.

292. *Research Problems.* 2-6 hr. PR: A.E. 291 or consent. Performance of the research project as proposed in A.E. 291. Project results are given in written technical reports, with conclusions and recommendations.

300. *Seminar.* Credit. Attendance required of all graduate students at scheduled aerospace engineering seminars.

315. *Fluid Flow Measurement.* 3 hr. PR: A.E. 112 or consent. Principles and measurements of static and dynamic pressures and temperatures, velocity and Mach number and forces. Optical techniques and photography. Design of experiments. Review of selected papers from the literature. 2 hr. lec., 3 hr. lab.

380. Special Problems. 2-4 hr. PR: Consent of department chairperson. For graduate students in the non-research program. The student will select a specialized field and follow a course of study in that field under the supervision of a counselor.

381. *Specialized Study Program.* 1-6 hr. PR: Consent. Discussion, individual study reports in aerospace engineering.

Agricultural Engineering

Ag.E.

201. *Farm Structures.* II. 3 hr. PR: M.E.M. 52. Design of structures for housing, recreation, agriculture, forestry, and related rural activities. Structural materials selection will be based on environmental and strength requirements, durability, economics and aesthetic values. 2 hr. rec., 3 hr. lab.

210. *Application of Electricity to Agriculture.* II. 3 hr. PR: E.E. 105. Design of systems using electrical energy in urban, rural and recreational applications. Electric power generation, safe wiring, lighting, heating, motors, control systems and their application for air conditioning, water and material handling systems. 2 hr. rec., 3 hr. lab.

220. *Agricultural Process Engineering.* II. 3 hr. PR: C.E. 115, M.E.M. 140. Handling and processing of materials. Fluid flow, materials handling, shaping, and grading, heat and mass transfer, drying, refrigeration, processing instrumentation and controls, cost analysis and processing plant analysis. 2 hr. rec., 3 hr. lab.

230. *Farm Power.* I. 3 hr. PR: M.E.M. 140. Application of power sources to stationary and mobile equipment used in forestry and agriculture. Includes engines and power units, transmission, control, man-machine interface, environmental impact and energy imput efficiency. 2 hr. rec., 3 hr. lab.

240. *Hydrology.* I. 3 hr. PR: C.E. 115. The hydrologic cycle with emphasis on precipitation and runoff as related to design of hydraulic structures, soil and water conservation, and flood control. 3 hr. rec.

250. *Soil and Water Conservation.* I. 3 hr. PR: C.E. 115. Principles and practices in the development, conservation, utilization and management of soil and water resources. 2 hr. rec., 3 hr. lab.

260. *Properties of Biological and Animal Materials.* II. 3 hr. PR: Biol. 1, M.E.M. 52 or consent. Physical properties of biological materials as related to harvesting, handling and transporting, conditioning, preserving and storing operations. Size, shape, density, moisture content, elastic and viscoelastic properties, strength and aerodynamic response. 2 hr. rec., 3 hr. lab.

280. *Agricultural Engineering Problems.* 1-3 hr. PR: Consent. Special problems relating to agricultural engineering.

290. *Elements of Machinery Design.* II. 3 hr. PR: M.E.M. 140. Analysis of design and management practices for agricultural and forestry production machinery. Traction and stability, power transmission systems, versatility, operational criteria, quality and safety. 2 hr. rec., 3 hr. lab.

340. *Problems in Hydrology.* I. 3 hr. PR: Ag.E. 240. Special problems in hydrograph analysis hydrologic performance of small watersheds, erosion and sedimentation, hydro-meteorological studies, flood runoff and peak discharge, drought, river forecasting, frequency analysis of hydrologic data. 3 hr. rec.

341. *Physical Climatology.* II. 3 hr. PR: Consent. Physical principles underlying the variations and changes in climate, climatic controls, elements of microclimatology, engineering applications and uses of climatic data. 3 hr. rec.

Forest Engineering

For. Eng'g.

291. *Logging Systems.* II. 3 hr. PR: W.S. 130 or consent. The engineering and economic aspects of equipment for short- and long-wood logging systems. Equipment cost analysis, transportation systems, equipment specifications, accident control and safety. 3 hr. rec.

391. *Logging Systems Engineering.* I. 3 hr. PR: Math. 18 or consent. Theory and design of modern forest harvesting systems such as balloon logging, cableways, pipelines and conveyors. Design features of specialized forest harvesting machines and devices. Systems engineering approach to equipment utilization. 3 hr. rec.

392. *Hydraulic Power.* II. 3 hr. PR: Math. 18 or consent. Hydraulic control circuits and design practice, includes components and elements, hydraulic fluid properties, characteristics of control components, feedback control approach and a semester problem of a complete circuit design. 3 hr. rec.

Chemical Engineering

Ch.E.

40. *Chemical Engineering Calculation I.* 2 hr. PR: Math. 15, Chem. 16, E. 2. Introduction to chemical engineering fundamentals and calculation procedures, industrial stoichiometry, real gases and vapor-liquid equilibria, heat capacities and enthalpies, material balances and energy balances. 2 hr. rec.

41. *Chemical Engineering Calculations II.* 2 hr. Continuation of Ch.E. 40. 2 hr. rec.

105. *Engineering Materials Science.* 3 hr. PR: Physics 12. Includes a study of the internal structures of metals, ceramics, and organic materials, and the dependence of properties upon these structures. Also, the behavior of materials under conditions involving mechanical stresses, thermal reactions, corrosion, electromagnetic fields and radiation. 3 hr. rec.

110. *Chemical Engineering Fundamentals.* 3 hr. PR: Math. 17, Ch.E. 41. Phase diagrams. Equilibrium stage calculations including counter-current multistage operations with reflux. Introduction to fluid flow, heat transfer and mass transfer. Shell and macroscopic balances for transfer rate processes. Applications including computer techniques. Laboratory demonstrations. 3 hr. rec.

111. *Chemical Engineering Fundamentals.* 3 hr. Continuation of Ch.E. 110. 3 hr. rec.

142. *Chemical Engineering Thermodynamics and Kinetics.* 3 hr. PR: Ch.E. 41. First and second law of thermodynamics. Real material thermodynamic functions. Physical and chemical reactions, catalytic reactions. Influence of transport phenomena on reaction rate. Chemical reactors. 3 hr. rec.

143. *Chemical Engineering Thermodynamics and Kinetics.* 3 hr. Continuation of Ch. 142. 3 hr. rec.

170, 171. *Chemical Engineering Professional Block.* 1-10 hr. ea. PR: Completion of all technical courses prescribed for the first three years. Professional aspects of chemical engineering involving analysis, synthesis and design, process dynamics, design of experiments, materials, engineering design and computation laboratories, and seminar on engineering practice and ethics. Includes a comprehensive plant design project.

197. *Thesis.* 2-5 hr. Open only to qualified seniors. A problem in chemical engineering or industrial chemistry is selected for investigation. A carefully prepared report is required. 6-15 hr. lab.

224. *Process Development.* 3 hr. PR: Chem. 134, 144, Ch.E. 111 and 143. Development of process systems from the modified unit operations-unit process concept. Thermodynamics and kinetics in evaluation of system requirements and performance. 3 hr. rec.

231. *Mathematical Methods in Chemical Engineering.* 3 hr. PR: Math. 18. The classification and solution of mathematical problems important in chemical engineering. Treatment and interpretation of engineering data. Analytical methods for ordinary and partial differential equations including orthogonal functions and integral transforms. 3 hr. rec.

251. *Metallurgical Engineering.* 3 hr. PR: Physics 12. Principles of production of metals and alloys, plastic deformation of metals, corrosion and metal failure. 3 hr. rec.

253. *Ceramic Engineering I.* 3 hr. PR: Physics 12. Characterization of ceramic systems. Study of internal structure and structure sensitive properties, liquid and solid solutions; rheology; mechanical, thermal, chemical, optical, and electrical properties. 3 hr. rec.

258. *Polymers and Polymer Technology.* 3 hr. PR or Conc.: Chem. 134. Polymers and their handling. Properties of macromolecules as influenced by molecular weight, polymerization methods, plastics technology, polymer engineering. 3 hr. rec.

270. *Strategy of Process Engineering.* 3 hr. PR: Ch.E. 111 or consent. Latest theories of process design and process optimization, proven through regular use by practicing engineers, are applied to the major problems of process engineering. 3 hr. rec.

280. *Chemical Engineering Problems.* 1-6 hr. For juniors, seniors, and graduate students. May be used to correct deficiencies preparatory or following courses such as Ch.E. 170 and 171, or for students in other disciplines desiring to take only a portion of a course.

290. *Introduction to Nuclear Engineering.* 3 hr. PR: Junior standing. Introduction to fundamental principles and applications of nuclear technology in science and engineering fields. Studies of nuclear fission and the design and operation of nuclear reactor systems; uses of radioisotopes as power sources and in materials processing, testing and medicine; health physics and radiation detection and shielding.

301. *Transport Phenomena.* 3 hr. PR or Conc.: Ch.E. 231 or equiv. Introduction to the equations of change (heat, mass and momentum transfer) with a differential balance approach. Use in Newtonian flow, turbulent flow, mass and energy transfer, radiation, convection. Estimation of transport coefficients. 3 hr. rec.

307. *Distillation.* 2-5 hr. PR: Math. 18 and consent. Vaporization principles of separation of liquid mixtures, steam, batch, continuous, azeotropic, extractive, and molecular distillation. 3 hr. rec., 0-6 hr. lab.

324. *Advanced Process Development.* 3 hr. PR: Consent. Extended and generalized unit process and operation concepts; specialized synthetic methods; reaction mechanisms and their effects on equipment design and performance; properties, their evaluation, prediction and marketability; industrial toxicology and plant safety. 3 hr. rec.

330. *Process Dynamics and Control.* 3 hr. PR: Consent. Dynamic response of processes and control instruments. Use of Laplace transforms and frequency response methods in analysis of control systems. Application of control systems in chemical reactors, distillation, and heat transfer operations. Introduction to non-linear systems. 3 hr. rec.

344. *Thermodynamics.* 3 hr. PR: Consent. Logical development of thermodynamic principles. These are applied to selected topics including development and application of the phase rule, physical and chemical equilibria in complex systems and non-ideal solutions. Introduction to non-equilibrium thermodynamics. 3 hr. rec.

345. *Chemical Reaction Engineering.* 3 hr. PR: Consent. Homogeneous reactions, batch and flow reactors, ideal reactors, macro and micro mixing, non-ideal flow reactors, heterogeneous reaction systems, catalytic and non-catalytic reactions, reactor stability analysis, reactor optimization. 3 hr. rec.

358. *Polymer Processing.* 3 hr. PR: Chem. 134 or consent. Analytical description of rheology, molding, extrusion, bonding, polymer modification operations, and physical properties. 3 hr. rec.

370. *Process Equipment Design I.* 3 hr. PR: Ch.E. 301 or consent. Design, sizing, optimization, and cost estimation of equipment used for heat transfer; emphasis on design techniques; computer design techniques discussed where applicable. 3 hr. rec.

371. *Process Equipment Design II.* 3 hr. PR: Ch.E. 301 or consent. Design, sizing, optimization, and cost estimation of equipment used for mass transfer operations; emphasis on practical aspects of equipment design; computer design techniques discussed where applicable.

390. *Nuclear Reactor Systems I.* 3 hr. PR: Consent. Intended as a first course for graduate students in the area of power reactor systems analysis and design. Includes topics such as neutron interactions with reactor materials, fission, reactor physics, reactor heat generation and removal, and thermal reactor core design.

391. *Nuclear Reactor Systems II.* 3 hr. PR: Ch.E. 309. Continuation of Ch.E. 390. Reactor kinetics, nuclear power economics, and case studies and analyses of the following reactor systems; pressurized-water, boiling-water, fast breeder, and gas-cooled power plants.

392. *Interaction of Radiation and Matter.* 1-3 hr. PR: Consent. Types of radiation, energy deposition by radiation, experimental instrumentation, formation and reactions of radiation-chemical species. 1-3 hr. rec.

Civil Engineering

C.E.

1.* *Surveying.* 2 hr. PR: Math. 4. Elementary theory of measurement of distance, bearing and azimuth direction and difference in elevation. Field work with transit, tape, level and theodolite. Office computation and plotting. 1 hr. rec., 3 hr. lab.

5.* *Land Surveying.* 4 hr. PR: Math. 4. Primarily for forestry students. Theory and practice with compass, transit, level, stadia, and plane table; computations of area; astronomical observations; map plotting. 2 hr. rec., 6 hr. lab.

6.* *Topographic Mapping.* 2 hr. PR: C.E. 5. Primarily for forestry students. Topographic maps; surveys for roads and property lines; U.S. Public Land Surveys; practice in lettering, plotting, and inking of topographic maps. 1 hr. rec., 3 hr. lab.

90. *Introduction to Civil Engineering.* 1 hr. Historical foundations of civil engineering and the role of the profession. Basic areas of civil engineering future introduced. Process of integrating the digital computer into service for the civil engineer discussed. 3 hr. rec. and lab.

101. *Survey Engineering.* 4 hr. PR: C.E. 90 or consent. Theory of measurements and errors; introduction to least squares adjustments; field astronomy for determination of latitude and azimuth; horizontal and vertical curves; easement curves; earthwork volumes; triangulation; boundary surveying; omitted measurements; partition of area. 3 hr. rec., 3 hr. lab.

110. *Civil Engineering Materials.* 4 hr. PR: M.E.M. 52 and C.E. 90 or consent. Physical, chemical and molecular properties of materials commonly employed in civil engineering works. Influence of these properties on the performance and use of these materials. Emphasis on laboratory evaluation of properties that control the performance of materials in use and the established criteria for judging suitability of materials for specific applications. 3 hr. rec., 3 hr. lab.

115.* *Fluid Mechanics.* 3 hr. PR: M.E.M. 52. Fluid statics, laminar and turbulent flow of compressible and incompressible fluids, flow measurements, open channel flow, and kinetics of fluids. 3 hr. lab.

120. *Fluid Mechanics and Hydraulics.* 4 hr. PR: M.E.M. 51. Fluid statics, laminar and turbulent flow of compressible and incompressible fluids, flow measurements, water hammer and surging, open channel uniform and nonuniform flow, sediment transport. 3 hr. rec., 3 hr. lab.

131. *Highway Engineering.* 4 hr. PR: C.E. 101 and 180. Highway administration, economics, and finance; planning and design; subgrade soils and drainage; construction and maintenance. Design of a highway. Center line and grade projections, earthwork and cost estimate. 3 hr. rec., 3 hr. lab.

146. *Sanitary Engineering I.* 3 hr. PR: C.E. 120. Hydrology as applied to water and waste systems. Design of water distribution and waste water systems. Study and partial design of water and waste water treatment facilities. 3 hr. rec.

147. *Sanitary Engineering II.* 3 hr. PR: Junior standing. Examination of water and waste water, water treatment, waste water treatment and special problems in public health, air pollution, and radioactivity. 2 hr. rec., 3 hr. lab.

160. *Structural Analysis I.* 3 hr. PR: M.E.M. 51 and C.E. 90 or consent. Analysis of axial forces moments and shears in statically determinate structures caused by fixed and moving loads. Study of influence lines for frames and trusses. 3 hr. rec.

169. *Introduction to Structural Design.* 3 hr. PR: C.E. 110, 160. Fundamental concepts of structural design in steel, reinforced concrete and timber for axially loaded members, members in bending, and members subjected to axial load and bending. 3 hr. rec.

180. *Soil Mechanics.* 4 hr. PR: C.E. 110. Origins and distributions of soils, classification of soils, fundamental soil properties, and stresses in soils. Subsurface exploration. Foundations design and design and construction of earth structures. 3 hr. rec., 3 hr. lab.

190. *Civil Engineering Problems.* 1-4 hr. For junior and senior students.

195. *Seminar.* Credit. PR. Junior or senior standing. Lectures by noted engineering and engineering-related practitioners and educators. Discussion of matters of mutual concern to students and faculty.

212. *Concrete and Aggregates.* 3 hr. PR: C.E. 110 or consent. Considerations and methods for the design of concrete mixes. Properties of portland cement and aggregates and their influence on the design and performance of concrete mixtures. Test methods for concrete and aggregates and the significance of these tests. 2 hr. rec., 3 hr. lab.

213. *Construction Methods.* 3 hr. PR: C.E. Senior standing. Study of construction methods, equipment, and administration with particular emphasis on the influence of new technology developments. 3 hr. rec.

222. *Open Channel Flow.* 3 hr. PR: C.E. 120. Hydraulic problems associated with natural waterways, man made waterways, and design of hydraulic structures of open channels. 3 hr. rec.

232. *Principles of Transportation Engineering.* 3 hr. PR: C.E. 131 or consent. Basic approach to the problem of integrated transportation systems from standpoint of assembly, haul, and distribution means. Analysis of the characteristics of the transport equipment and traveled way. Power requirements, speed, stopping, capacity costs, economics of location and route selection. Future technological developments and innovations. 3 hr. rec.

235. *Railway Engineering.* 3 hr. PR: C.E. 101. Development and importance of the railroad industry. Principles of location, construction, operation and maintenance. 3 hr. rec.

251. *Public Health Engineering.* 3 hr. PR: C.E. 146 or 147 or consent. Engineering aspects involved in control of the environment for the protection of health and promotion of comfort of man. Communicable disease control, milk and food sanitation, air pollution, refuse disposal, industrial hygiene, and radiological health hazards. 3 hr. rec.

252. *Water Resources Engineering.* 3 hr. PR: C.E. 120. Design of water-resources systems. The interrelationship between economic objectives, engineering analysis, and government agencies. 3 hr. rec.

260. *Structural Analysis II.* 3 hr. PR: C.E. 160. Fundamental theory of statically indeterminate structures. General theory of continuity and iterative and energy methods applied to the analysis of indeterminate beams and frames. 3 hr. rec.

270. *Structural Design I.* 3 hr. PR: C.E. 169, or consent. Theory and design of reinforced concrete members. Design considerations for concrete bridges and buildings. 2 hr. rec., 3 hr. lab.

271. *Structural Design II.* 3 hr. PR: C.E. 169, or consent. Design of steel bridge and building structures. Welded, riveted, and bolted connections; simple and moment-resistant connections; cost estimates. 2 hr. rec., 3 hr. lab.

281. *Foundations Engineering.* 3 hr. PR: C.E. 180. Soils exploration and the design and analysis of engineering foundations. Emphasis on earth pressures and design of retaining walls, studies of bracing systems, and the elements of shallow and deep foundations for bridges and buildings. Movement of water through soil structures and control of water in excavations. 3 hr. rec.

291. *Comprehensive Project for Civil Engineers.* 3 hr. PR: Senior standing or consent. Application of civil engineering principles, through group studies, to develop a solution for a comprehensive engineering problem. Consideration given to a problem involving all aspects of civil engineering. 2 hr. rec., 3 hr. lab.

307. *Photogrammetry.* 3 hr. PR: C.E. 101. Geometry and interpretation of aerial photography; flight planning; radial-line control; principles of stereoscopy; plotting instruments. 2 hr. rec., 3 hr. lab.

308. *Geodesy.* 3 hr. PR: C.E. 101. Precise base line measurements, triangulation and leveling, geodetic astronomy; figure of the earth, map projections; rectangular coordinate systems; least squares adjustment; gravity. 3 hr. rec.

310. *Bituminous Materials and Mixtures.* 3 hr. PR: C.E. 110 or consent. Manufacture, testing, and nature of bituminous materials. Principles of the design and behavior of bituminous mixtures including the influence of aggregates, temperature, and other variables on the design for stability and durability. Significance of test methods and specifications. Construction practice. 2 hr. rec., 3 hr. lab.

311. *Pavement Design.* 3 hr. PR: C.E. 110, 180. Effects of traffic, soil, environment, and loads on the design and behavior of pavement systems. Design of flexible and rigid pavements, bases, and sub-bases. Consideration of drainage and climate. Pavement performance and performance surveys. 3 hr. rec.

332. *Airport Planning and Design.* 3 hr. PR: C.E. 131 or consent. Airport financing, air travel demand modeling, aircraft trends, air traffic control, site selection, ground access, noise control, geometric design, pavement design, and terminal facilities. 3 hr. rec.

333. *Geometric Design of Highways.* 3 hr. PR: Consent. The theory and practice of geometric design of modern highways. Horizontal and vertical alignment, cross-slope, design speed, sight distances, interchanges, and intersections. Critical analysis of design specifications. 2 hr. rec., 3 hr. lab.

334. *Introduction to Traffic Engineering.* 3 hr. PR: C.E. 131, or consent. The purpose, scope, and methods of traffic engineering. Emphasis on the three basic elements of the transportation system, i.e. the human, vehicle, and roadway. Characteristics of each element and interactions between the elements. Laboratory devoted to conducting simple traffic studies, solving practical problems, and designing traffic facilities. 2 hr. rec., 3 hr. lab.

345. *Properties of Air Pollutants.* 3 hr. PR: Consent. Physical, chemical biological and social behavioral properties of dusts, droplets, and gases in the atmosphere. Air pollutant sampling and analysis. Planning and operating air pollution surveys. 2 hr. rec., 3 hr. lab.

349. *Solid Waste Disposal.* 3 hr. PR: Consent. Study of traditional patterns and problems of solid waste storage, transport, and disposal. Examination of various engineering alternatives with appropriate consideration for air and water pollution control and

land reclamation. Analytical approaches to recovery and reuse of materials. 2 hr. rec., 3 hr. lab.

350. *Sanitary Chemistry and Biology.* 3 hr. PR: C.E. 147 or consent. Study of physical and chemical properties of water. Theory and methods of chemical analysis of water, sewage, and industrial wastes. Biological aspects of stream pollution problems. 2 hr. rec., 3 hr. lab.

356. *Principles of Biological Waste Treatment.* 3 hr. PR: C.E. 350 or consent. Examination of biological systems used in waste treatment as to ecology and function. Models used to describe system behavior are developed. Laboratory experiments performed to understand operation and design of treatment plants. 2 hr. rec., 3 hr. lab.

359. *Basic Radiological Health.* 3 hr. PR: Consent. Fundamentals theory and terminology. Environmental and occupational hazards in the nuclear field. Radioactive waste disposal. Laboratory measurements of radioactivity. 2 hr. rec., 3 hr. lab.

361. *Statically Indeterminate Structures.* 3 hr. PR: C.E. 260 or consent. Advanced topics in indeterminate structural analysis for trusses, nonprismatic members and frames. 3 hr. rec.

363. *Introduction to Structural Dynamics.* 3 hr. PR: Math. 18 and C.E. 361 or 460. General theory for dynamic response of systems having one or several degrees of freedom. Emphasis on the application of dynamic response theory to structural design. 3 hr. rec.

372. *Plastic Design of Steel Structures.* 3 hr. PR: C.E. 260, 271, or consent. The fundamental concepts of inelastic behavior in steel. Analysis of structures for ultimate load. The influence of axial forces, shear forces, and local buckling on the plastic moment. Study of structural connections and deflections. Steel structures design. 3 hr. rec.

373. *Prestressed Concrete.* 3 hr. PR: C.E. 270 or consent. The analysis and design of determinate and indeterminate prestressed beams and frames. 3 hr. rec.

374. *Timber Design.* 3 hr. PR: C.E. 160 and For. 261 or consent. Emphasis on fundamentals of modern timber design and analysis. Topics include a review of wood properties, design of beams, columns, arches, trusses, and pole structures using dimensional lumber, glue-laminated and plywood components. Detailed study of connections using nails, shear connectors, and adhesives. 3 hr. rec.

380. *Soil Properties and Behavior.* 3 hr. PR: C.E. 180 or consent. Soil mineralogy and the physico-chemical properties of soils and their application to an understanding of the behavior of soils. A detailed review of the basic and classical theories of permeability, consolidation, shear strength, and compaction. Prediction of engineering behavior of soils in light of physico-chemical concepts. 3 hr. rec.

381. *Soil Testing.* 3 hr. PR: C.E. 180 or consent. Complements and expands the material covered in C.E. 380 from an experimental standpoint. Experimental studies conducted to demonstrate empirical and theoretical principles. Emphasis on the proper interpretation of experimental results and application of such results to practical problems. 1 hr. rec., 6 hr. lab.

Electrical Engineering

E.E.

20.* *Introduction to Electrical Engineering.* 3 hr. PR: Math. 16. Fundamental definitions and concepts of electrical engineering, units, circuit elements, basic circuit laws, measurement principles, and introduction to network theory. 2 hr. rec., 3 hr. lab.

23.* *Electric Circuits I.* 3 hr. PR: E.E. 20, Math. 18 (or Conc.). Sinusoidal steady state, network theorems. Fourier series and classical network solutions. 2 hr. rec., 3 hr. lab.

105.* *Electrical Fundamentals I.* 4 hr. PR: Math. 18, Physics 12. Fundamental principles of electrical circuit analysis, power and power factor. Fundamentals of magnetic circuits, induced electromotive force, transformers and electrical machines. (Primarily for non-electrical engineering students.) 3 hr. rec., 3 hr. lab.

106.* *Electrical Fundamentals II.* 4 hr. PR: E.E. 105. Principles of electronics, electronic devices, amplifiers and models, digital devices and logic circuits, instrumentation and introduction to control systems. (Not open to electrical engineering students.) 3 hr. rec., 3 hr. lab.

125.* *Signals and Systems I.* 4 hr. PR: E.E. 23 or equiv., Math. 18. Introduction to the basic concepts and analysis of deterministic signals and linear systems utilizing convolution, Fourier Transforms, and Laplace Transforms. Laboratory exercises illustrate the practical application of these concepts. 3 hr. rec., 3 hr. lab.

126.* *Signals and Systems II.* 3 hr. PR: E.E. 125. Introduction to state-space methods, random signals, correlation functions, and spectral density. Concepts and techniques are applied to communication and feedback systems. 3 hr. rec.

130. *Electromechanical Energy Conversion.* 3 hr. PR: E.E. 125, 140. Fundamentals of electromechanical energy conversion, transformers, and rotating machines. 2 hr. rec., 3 hr. lab.

131. *Introduction to Power Systems.* 3 hr. PR: E.E. 130. Analysis of power system elements connected together as an integrated system for the transmission and distribution of electric power. 2 hr. rec., 3 hr. lab.

140.* *Electric and Magnetic Fields I.* 3 hr. PR: Math. 18, Physics 12. Introduction to vector analysis, orthogonal coordinate systems, Maxwell's equations, scalar and vector potentials, electric and magnetic static fields, boundary-value problems, Laplace's and Poisson's equation, electromagnetic static fields. 3 hr. rec.

141. *Electric and Magnetic Fields II.* 3 hr. PR: E.E. 140. Plane waves in lossless and dissipative media, polarization, reflection and refraction of plane waves, lossless and dissipative transmission lines, waveguides, radiation and antennas. 3 hr. rec.

150.* *Electronic Properties of Materials.* 3 hr. PR: E.E. 23 or equiv. Physical principles of electrical charge transport in solids, vacuum, and gases. Application of these principles in the study of diodes, transistors, integrated electronics, and other electronic devices. 3 hr. rec.

152.* *Electronics I.* 4 hr. PR: E.E. 125, 150. Principles of operation and application of electronic devices. Use of device models in amplifiers, switching circuits, and power conversion applications. 3 hr. rec., 3 hr. lab.

154.* *Electronics II.* 4 hr. PR: E.E. 152. Theory and application of feedback. Power amplifiers. Analysis, design and application of integrated circuit building blocks. Application of linear and digital functional circuits in electronic systems. 3 hr. rec., 3 hr. lab.

200. *Seminar.* (Credit). PR: Senior standing. Special material and projects.

201.* *Electronics for Scientists.* 3 hr. PR: General physics and calculus or consent. Special course for chemists, physicists, medical researchers, and other research workers having a limited background in electronics. Electrical and electronic fundamentals. Application of electronic instrumentation and electrical signal processing. (Not normally open to engineering students.) 2 hr. rec., 3 hr. lab.

216. *Fundamentals of Control Systems.* 3 hr. PR: E.E. 126. Fundamental concepts of feedback control system analysis; stability, and design in the frequency, complex variable, and time domains. Includes Nyquist, root locus and state variable concepts, Mitrovic's method and Chen's method. 3 hr. rec.

218. *Engineering Analysis and Design.* 3 hr. PR: E.E. 130, 154, 200. Application of the method of engineering analysis based upon fundamental physical laws, mathematics, and practical engineering consideration. Emphasis on the professional approach to analysis of engineering problems. 3 hr. rec.

230. *Symmetrical Components.* 3 hr. PR: E.E. 131 or consent. Analysis of polyphase systems in unbalanced and transient conditions. 3 hr. rec.

231. *Electrical Power Systems.* 3 hr. PR: E.E. 131 or consent. Analytical methods for steady-state performance of power systems. 3 hr. rec.

234. *Electric Power Transmission and Distribution.* 3 hr. PR: E.E. 131 or consent. An introduction to power system stability. 3 hr. rec.

235. *Electrical Machinery I.* 3 hr. PR: E.E. 130 or consent. Energy state functions; Lagrange's equation; dynamic equations of motion of electromechanical systems; generalized magnetic field type, rotating, electromechanical energy converter; two phase transformations; dynamics of commutator machines; induction machines and synchronous machines. 2 hr. rec., 3 hr. lab.

236. *Electrical Machinery II.* 3 hr. PR: E.E. 235 or consent. Electromagnetic fields in electrical devices; selected topics on induction motors and transformer engineering, including surge phenomena; insulation of electrical equipment; winding of A.C. and D.C. machines. 2 hr. rec., 3 hr. lab.

244. *Introduction to Antennas and Radiating Systems.* 3 hr. PR: E.E. 141 or consent. Radiation from current distributions, linear antennas, far field approximations, field equivalence theorems, aperture antennas, antenna arrays, patterns, and gain, and application to specific antenna types. 3 hr. rec.

245. *Microwave Circuits and Devices.* 3 hr. PR: E.E. 141. UHF transmission line theory, impedance matching techniques and charts, general circuit theory of one port and multiports for waveguiding systems, impedance and scattering matrices, waveguide circuit elements, microwave energy sources. Course supplemented by laboratory problems. 3 hr. rec.

252. *Electronics III.* 3 hr. PR: E.E. 154. Analysis of modulation and demodulation systems, oscillators, active filters, and microwave sources. 3 hr. rec.

253. *Physical Electronics I.* 3 hr. PR: E.E. 150 (or equiv.). Physical principles of electrical conduction and the application of these principles to electronic conduction in vacuum, gases, and solids. Properties of semi-conductors, junction diodes and transistors, field-effect transistors. 3 hr. rec.

257. *Transistor Circuits.* 3 hr. PR: E.E. 152 (or equiv.). Application of the basic principles of semiconductor electronics to junction and field-effect devices. Development of equivalent circuits for junction diodes, transistors, and field-effect transistors. 3 hr. rec.

264. *Introduction to Communications Systems.* 3 hr. PR: E.E. 126. Introduction to the first principles of communication systems design. Analysis and comparison of standard analog and pulse modulation techniques relative to bandwidth, noise, threshold, and hardware constraints. Communication systems treated as opposed to individual circuits and components of the system. 3 hr. rec.

271.* *Theory of Digital Computers.* 3 hr. PR: Consent. Introduction to the field of digital computer design. Topics include general computer organization, number systems and number representations, Boolean algebra and its application to computer design, and characteristics of major parts of a computing system. 3 hr. rec.

275. *Pulse Techniques.* 3 hr. PR: E.E. 152. Introduction to the response of electrical networks to non-sinusoidal inputs, analysis of active networks with large signals and the circuits and techniques used in pulse and digital equipment. Students use the University's computing facilities by solving problems using ECAP. No previous programming is needed. 3 hr. rec.

278.* *Analogue Computers.* 3 hr. PR: Math. 18. The theory and operation of analogue computers. Amplitude scaling and time scaling on the computer and application of computer to solution of differential equations. 3 hr. rec.

280. *Electrical Problems I.* 1-3 hr. For juniors and seniors.

312. *Feedback System Theory.* 3 hr. PR: E.E. 216, 325. Signal flow graphs; sensitivity; return difference; mathematical definition of feedback; effects of feedback; multiple loop systems; multivariate systems. 3 hr. rec.

315. *State Variable Analysis of Systems.* 3 hr. PR: Consent. Matrix theory and linear transformations as applied to linear control systems. The state-space on time-domain study of stability, controllability, observability, etc. 3 hr. rec.

316. *Synthesis of Feedback Systems I.* 3 hr. PR: E.E. 312, 364. Methods of direct synthesis and optimization of feedback systems; Wiener theory; Pontryagin's maximum principles; dynamic programming; adaptive feedback systems. 3 hr. rec.

325. *Advanced Linear Circuit Analysis.* 3 hr. PR: Consent. Systematic formulation of circuit equations. Use of operational techniques to find total solutions. Applications and characteristics of the Laplace and Fourier Transforms. Matrix algebra, complex variable theory and state variables are made to circuit analysis and elementary circuit synthesis. 3 hr. rec.

328. *Modern Network Synthesis.* 3 hr. PR: E.E. 325 or consent. Two-terminal network synthesis; Brune and Bott-Duffin syntheses; four-terminal networks; modern filter synthesis; Darlington synthesis transfer-function synthesis; ladder and lattice synthesis; potential analogy and approximation. 3 hr. rec.

330. *Electrical Machinery III.* 3 hr. PR: E.E. 236 or consent. Mathematical description of a synchronous machine; steady-state, balanced synchronous operation; three-phase short-circuit analysis; single-phase short-circuit analysis; double-line-to-ground short circuit and sequential faults; short-circuit torques; starting torque; voltage dip, synchronzing phenomena and sustained oscillations. 3 hr. rec.

331. *Electrical Power Systems.* 3 hr. PR: E.E. 231 or consent. Electrical transients on power systems including traveling waves due to lightning and switching. Principles of lightning protection. 3 hr. rec.

333. *Application of Digital Computers to Power System Analysis I.* 3 hr. PR: E.E. 231 or consent. Incidence and network matrices; algorithms for their formulation; three-phase networks; short-circuit calculations; load-flow studies. 3 hr. rec.

340. *Electromagnetic Fields and Guided Waves I.* 3 hr. PR: E.E. 141 or equiv. Plane waves in dielectrics, conducting, and anisotropic media; polarization; radiation; duality; uniqueness; image theory; equivalence principle; Green's functions; integral equations; plane wave functions. 3 hr. rec.

350. *Electronic Circuits. II.* 3 hr. PR: E.E. 154 or equiv. Analysis and design of electronic circuits; low-pass and band-pass amplifiers, single-tuned and double-tuned stages, equal ripple and maximally flat responses. 3 hr. rec.

353. *Physical Electronics.* II. 3 hr. PR: E.E. 154 or equiv. Semi-conductor surfaces; surface states, space charge and the field effect. 3 hr. rec.

357. *Linear Integrated Circuits.* I. 3 hr. PR: E.E. 154 or equiv. Techniques of integrated circuit design and fabrication. Development of models descriptive of linear and nonlinear transistor operation. Design and analysis of high frequency tuned, dc, and

differential amplifiers. Primarily for students specializing in communication and electronics. 3 hr. rec.

358. *Integrated Logic Circuits.* II. 3 hr. PR: E.E. 154 or equiv. or consent. Techniques of integrated circuit design and fabrication. Development of transistor model for nonlinear operation. Design, analysis, and comparison of emitter-coupled, direct-coupled, diode-transistor, and transistor-transistor integrated logic circuits. Intended for students specializing in digital circuits. 3 hr. rec.

364. *Communication Theory.* 3 hr. E.E. 264 or consent. Detailed study of probability theory and its use in describing random variables and stochastic processes. Emphasis on applications to problems in communication system design. 3 hr. rec.

366. *Information Theory I.* 3 hr. PR: E.E. 364. Probability concepts; theory of discrete systems; encoding; theory of continuous systems; systems with memory; the fundamental theorem of information theory. 3 hr. rec.

370. *Switching Circuit Theory I.* 3 hr. PR: E.E. 271 or equiv. The course presumes an understanding of the elements of Boolean or switching algebra. A study of both combinational and sequential switching circuits with emphasis on sequential networks. Advanced manual design and computer-aided-design techniques for single and multiple output combinational circuits are covered initially. Analysis and design of sequential circuits. Detection and prevention of undesired transient outputs. 3 hr. rec.

373. *Design of Computer Arithmetic Circuits I.* 3 hr. PR: E.E. 271 or equiv. Detailed study of computer circuitry usable in performing binary arithmetic. Logic, circuitry, and engineering aspects of digital computer equipment design. Primary emphasis on design of high speed, parallel arithmetic units using the natural binary number system. Analysis of systems for representing negative numbers. Study of various means for obtaining high speed addition, subtraction, and multiplication. 3 hr. rec.

374. *Design of Computer Arithmetic Circuits II.* 3 hr. PR: E.E. 373. Continuation of E.E. 373. High speed binary division, floating point arithmetic, modular or residue arithmetic, and techniques for checking arithmetic are covered. Recent innovations studied as literature becomes available. 3 hr. rec.

380. *Electrical Problems II.* I, II, S. 1-6 hr. For graduate students.

390. *Advanced Independent Study.* I, II, S. 1-6 hr. PR: Consent. Individual investigation in advanced electrical engineering subjects not covered in formal courses.

Industrial Engineering

I.E.

6.* *Welding, Forming, and Heat Treatment.* 2 hr. Molding and casting of non-ferrous metals, oxyacetylene and electric welding, resistance welding of plates, pipes, tubing, etc. Lectures, recitations, demonstrations, and laboratory practice. 6 hr. lab.

7.* *Welding and Heat Transfer.* 1 hr. PR: Consent. Practice in cutting and welding steel and cast iron with oxyacetylene and arc welding equipment. Demonstration of different methods of heat treatment. 3 hr. lab.

8.* *Machine Work.* 2 hr. Equipment, purpose, and character of operation, methods of holding work, turning, boring, drilling, grinding, and shaping. Use of precision measuring instrument. Two 3 hr. labs.

20.* *Fundamentals of Industrial Engineering.* 3 hr. PR: Sophomore standing. Principles of organization and organization charts and basic fundamentals of industrial engineering. History of labor-management relations, review of labor laws, and collective bargaining.

100.* *Manufacturing Processes.* 3 hr. Lectures, demonstrations, and laboratory work relating to methods, types of equipment, and character of operations of welding machines and machine tools. Emphasis on economic use of machine tools, assembly line manufacture, gauging, and inspection. 2 hr. rec., 3 hr. lab.

140.* *Motion and Time Study.* 3 hr. PR: Junior standing. Principles and techniques, job analysis, standardization, and formula construction; stop watch and micromotion analysis of industrial operations; development of production and incentive standards. Human factors. 2 hr. rec., 3 hr. lab.

142. *Production Control.* 3 hr. PR: I.E. 140, 213. Planning, scheduling, routing and dispatching in manufacturing operations and production control systems. Problems in industrial plant design. Layout for operation and control. Space utilization. 3 hr. rec.

170.* *Accounting for Engineers.* 3 hr. PR: Junior standing. The accounting cycle, journals, and ledgers; fixed assets and depreciation; financial statements. Essentials of cost accounting. Emphasis on utilization of cost data and reports by management, indicating management's control over industrial operations. 3 hr. rec.

181. *Introduction to Digital Computation.* 3 hr. PR: Math. 2 or 3. Introduction to FORTRAN programming for non-quantitative students. Emphasis on development of skills in both problem definition and coding. Class projects are chosen to illustrate application of computer programming to variety of problems. 2 hr. rec., 3 hr. lab.

201.* *Metal-Cutting Theory and Practice.* 3 hr. PR: I.E. 100 and Ch.E. 105. Metal-cutting tools, tool materials, work materials, cutting fluids, process of chip formation, cutting forces, tool-life tests, economics of tool life, measurement of product. 2 hr. rec., 3 hr. lab.

202. *Metal Forming Manufacturing Processes.* 3 hr. PR: I.E. 100 or consent. Applications and operations of the basic metal forming processes including primary metal working processes and metal shearing, drawing, bending, and squeezing processes, along with the machine tools required for these processes. 3 hr. rec.

203. *Metal Forming Theory.* 3 hr. PR: I.E. 202. Mechanics and basics of metal forming. Elementary theoretical and descriptive investigations of tube-sinking, deep-drawing, wire-drawing, extrusion, cold rolling, and forging. 3 hr. rec.

204. *Metal Casting Manufacturing Processes.* 3 hr. PR: I.E. 100 and Ch.E. 105 or consent. Fluidity processes in industry covering non-permanent processes, such as sand, centrifugal, investment, and shell molding. Some permanent mold methods investigated along with metal processes, molding machines, and costing design. 3 hr. rec.

205. *Tool Design.* 3 hr. PR: I.E. 100. Design, construction, application, and economic aspects of jigs, fixtures, and special tools used in manufacturing on a production basis. 2 hr. rec., 3 hr. lab.

213. *Engineering Statistics.* 3 hr. PR or Conc.: Math. 17, I.E. 281 or consent. Sample spaces and probability. Normal, binomial, Poisson, and other distributions with engineering applications. Measures of central tendency and dispersion. Tests of significance and confidence intervals. Introduction to regression analysis. Engineering applications emphasized throughout.

214. *Analysis of Engineering Data.* 3 hr. PR: I.E. 213. Introduction to linear statistical models. Design and analysis of the simpler experimental configurations occurring frequently in engineering studies. Similarities and differences between regression and experiment design models are emphasized in a vector-matrix setting. Digital computer is used extensively.

215. *Statistical Decision Making.* 3 hr. PR or Conc.: I.E. 213. Basic concepts of probability theory. Discrete and continuous distributions, joint and derived distributions, with application to industrial and research problems.

216. *Industrial Statistics.* 3 hr. PR or Conc.: I.E. 213. Economic objectives of quality control in manufacturing through sampling methods; Shewhart control chart for variables, attributes, and defects per unit; statistical approach to acceptance procedures. 3 hr. rec.

220. *Theory of Industrial Engineering and Organization.* 3 hr. History and development of scientific management in industry with early works of Taylor, Galbreth, and Gantt to the present. 3 hr. rec.

222.* *Job Evaluation and Wage Incentives.* 3 hr. PR: I.E. 140 or consent. Principles used in evaluating jobs, rates of pay, characteristics and objectives of wage incentive plans; incentive formulae and curves. 3 hr. rec.

241.* *Methods Analysis.* 2 hr. PR: I.E. 140 consent. The techniques of methods analysis as an effective means of methods improvement and cost reduction. 2 hr. rec.

243. *Plant Layout and Design.* 3 hr. PR: I.E. 142. Problems in industrial plant design. Equipment location, space utilization, layout for operation and control, flow sheets, materials handling. Allied topics in power utilization, light, heat, and ventilation. 1 hr. rec., 6 hr. lab.

249. *Design of Dynamic Material Systems.* 3 hr. PR: I.E. 140, 142 or consent. Application of industrial engineering theory and practice to selection of material systems and equipment including the efficient handling of materials from first movement of raw materials to final movement of finished product. Present quantitative design techniques included. 3 hr. rec.

250. *Introduction to Operations Research.* 3 hr. PR: I.E. 213. Basic tools and philosophies of operations research. Tools include: linear programming, queueing theory, inventory theory, and simulation. Other operations research techniques presented as they relate to the overall systems philosophy.

251. *Analytical Techniques of Operations Research.* 3 hr. PR: I.E. 213. Survey of nonlinear optimization techniques useful in operations research and industrial engineering studies. Includes classical optimization techniques, quadratic, geometric and dynamic programming, branch and bound and gradient techniques.

259. *Introduction to Systems Engineering.* 3 hr. PR: I.E. 214; Conc.: I.E. 250, 277. Quantitative synthesis of OR models. Definition of terms. Development and testing of assumptions, objectives, and restrictions. Measurement of parameters in the model. Optimization techniques and error sensitivity of the optimal solution. Implementing, utilizing and updating the model.

260. *Human Factors Engineering.* 3 hr. PR: Consent. A survey of human factors engineering which includes the study of ambient environment, human capabilities, and equipment design. Systems design for the man-machine environment interfaces will be studied with emphasis on health, safety, and productivity.

270.* *Standard Manufacturing Costs.* 3 hr. PR: I.E. 170. Development of standards for labor, material, and overhead expenses; uses of standards for control; analysis of variances between standard and actual costs. 3 hr. rec.

277. *Engineering Economy.* 3 hr. PR: Junior standing. Comparison of engineering alternatives using compound interest formulas and decision techniques based on annual costs, present worth, rate of return, benefit-cost ratio, depreciation, sunk costs, increment costs, retirement, replacement and taxes.

280. *Industrial Engineering Problems.* 1-3 hr. PR: Consent. Special problems relating to industrial engineering.

281. *Digital Computation for Engineers.* 3 hr. Conc.: Math. 16. Introduction to FORTRAN programming for engineering students. Emphasis on development of skills in both problem definition and coding. Class projects chosen to illustrate selected numerical and non-numeric processing methods.

282. *Digital Computer Concepts.* 3 hr. PR: I.E. 181 or 281 or consent. Principles of digital computer functional components. Study of digital operating systems, including structure of the various subsystem components, such as monitors, input control systems, and loaders.

283. *Information Retrieval.* PR: I.E. 181 or 281 or consent. Study of the tools, elements, and theories of information storage and retrieval. Areas of study include documentation, information framework; indexing; elements of usage, organization and equipment; parameters and implementation; theories of file organization and system design. 3 hr. rec.

284. *Simulation by Digital Methods.* 3 hr. PR: I.E. 213 or consent. Introduction to digital (Monte Carlo), simulation methods and their application to operations research problems. Student will develop computer programs to simulate and analyze practical situations. Interpretation of results emphasized.

285. *Electronic Computer Data Processing.* 3 hr. PR: Senior standing. Fundamentals of digital computer architecture and operations. Elements of number systems. Characteristics of computer systems components considered separately and connected as a system. Review of existing equipment systems with special emphasis on economics of their operation.

300. *Advanced Manufacturing Processes.* 3 hr. PR: I.E. 100. Advanced and complex manufacturing methods used in industry today. Assembly processes, automated manufacturing processes, and other product and process manufacturing methods will be examined.

301. *Advanced Metal-Cutting Theory and Practice.* 3 hr. PR: I.E. 201. The development of metal-cutting as a science through research, cutting-fluid theory, machinability of materials, tool materials, hot machining, tool-life tests, economics of machining. 3 hr. rec.

309. *Automation in Industry.* 3 hr. PR: I.E. 100 or consent. The evolution, production fundamentals, and control systems of the principal fully automatic machine tools, both fixed and flexible, will be covered along with the basic philosophy, fundamentals, and methods of automation as practiced in industry today. 2 hr. rec., 3 hr. lab.

314. *Design of Industrial Experiments.* 3 hr. PR: I.E. 214. Continuation of I.E. 214. Study of more complex experimental designs especially useful to engineering and industrial researchers, including factorials and optimum-seeking design. Emphasis on use of existing digital computer routines and interpretation of results.

316. *Advanced Industrial Statistics.* 3 hr. PR: I.E. 213. Advanced study of the economic application of statistics to quality control problems. Particular emphasis on developing models of quality control systems on the basis of statistical decision theory. Double and sequential sampling by attributes. Variables sampling plans. Advanced control chart methods. 3 hr. rec.

325. *Management Control.* 3 hr. PR: I.E. 170 or consent. A study of effective techniques for higher management control, including concepts and controls applicable to production management problems.

340. *Advanced Time Study.* 3 hr. PR: I.E. 140. Review of the various investigations which have been made, with special consideration given to the development of these studies into new fields. 3 hr. rec.

341. *Methods Analysis and Work Simplification.* 3 hr. PR: I.E. 140, 277. An advanced study of the techniques of methods analysis, including modern means of methods research. Development of appropriate cost analysis to accompany improved operation plans. A study of the design, installation, and administration of work simplification programs, suggestions systems, and remuneration policies, and the means of intraplant communications concerning such programs. 2 hr. rec., 3 hr. lab.

342. *Advanced Production Control.* 3 hr. PR: I.E. 250. A study of the different mathematical models useful in the design of effective production control systems. The various

models to be covered include: static production control models under risk and under uncertainty, dynamic models under certainty, under uncertainty, and under risk.

353. *Applied Mathematical Programming.* 3 hr. PR: I.E. 250 or consent. Consideration of the simplex, revised simplex and transportation algorithms; duality methods and parametric programming. Selected linear programming topics, such as decomposition, upper bounds, and the primal-dual algorithm. Applications to industrial and economic problems.

357. *Management Applications of Operations Research.* 3 hr. PR: Consent. Examination of contributions which operations research may make in business administration. Topics include linear programming, simulation, project management, data analysis, and data processing.

358. *Special Topics in Systems Analysis and Operations Research.* 3-6 hr. PR: Consent. Special topics from recent developments in operations research and related fields. Special emphasis will be placed on interests of current graduate students.

359. *Operations Research for Public Administrators.* 3 hr. PR: Consent. Examination of role of quantitative analysis in public administration and decisionmaking.

360. *Human Factors System Design.* 3 hr. PR: I.E. 260. Theoretical aspects and practical applications of man/machine relationships as they influence further system design. Human limitations with respect to acceptance of information, decisionmaking, and ability to transmit the result of such decisions to controlled equipment systems to obtain design optimization. 2 hr. rec., 3 hr. lab.

368. *Advanced Problems in Human Factors.* 1-3 hr. PR: I.E. 260 or 360 and graduate standing. Special problems relating to one of the areas of human factors such as simulation, controls, vigilance, maintainability, etc.

370. *Budget Control.* 3 hr. PR: I.E. 270. Principles involved in the preparation of budgets by functional divisions and the application of divisional budgets as control media. 3 hr. rec.

377. *Advanced Engineering Economy.* 3 hr. PR: I.E. 277. Special emphasis on depreciation, engineering and economic aspects of selection and replacement of equipment; relationship of technical economy to income taxation and load factor and capacity to economy. 3 hr. rec.

381. *Integrated Data Processing.* 3 hr. PR: I.E. 281 and consent. Advanced work in electronic data-processing systems and procedures design. Case studies of integrated data-processing systems. Course projects will include individual use of a computer in management data-processing analysis problems. 3 hr. rec.

385. *Digital Computer Applications.* 1 hr. PR: Graduate standing in engineering, physical science, or mathematics. Special study of a selected programming language.

Mechanical Engineering and Mechanics

M.E.M.

30. *Introduction to Mechanical Engineering.* 2 hr. PR: Math. 15. Conc.: M.E.M. 51. Introduction to principles and techniques in mechanical engineering. 6 hr. lab.

51. *Engineering Mechanics I.* 4 hr. PR: Math. 15, E. 2, or consent. Statics of rigid and deformable bodies. Vector operations, forces, moments, resultants, centroids, equilibrium, free body diagrams, trusses and frames, simple axial and shear stresses, mechanical properties of engineering materials, torsion, combined axial and torsion stresses, Mohr's circle of stress and strain, second moments of areas and volumes. 2 hr. rec., 3 hr. practicum.

52. *Engineering Mechanics II.* 4 hr. PR: Math. 16, M.E.M. 51, or consent. Continuation of M.E.M. 51 including dynamics of particles and rigid bodies. Shear and moment diagrams, stresses and deflections of beams, elastic columns, friction, particle kine-

matics, rigid body kinematics, particle kinetics; force, mass acceleration of rigid bodies, work-energy methods, momentum. 2 hr. rec., 3 hr. practicum.

101. *Thermodynamics.* 3 hr. PR: Physics 12, Math. 17. Principles of thermodynamics; properties of gases and vapors; vapor cycles; internal combustion engines cycles and refrigeration. Not open to students majoring in mechanical engineering. 3 hr. rec.

110. *Dynamics of Machines I.* 3 hr. PR or Conc.: Math. 18. Kinematic analysis and synthesis of linkage, gears, cams, and other basic mechanisms. 2 hr. rec., 3 hr. lab.

112. *Dynamics of Machines II.* 3 hr. PR: M.E.M. 110. Static and dynamic force analysis in mechanical systems. Principles of vibration theory and balancing of rotating machinery. Rigid body motion and gyroscopes. 3 hr. rec.

134. *Mechanical Engineering Design.* 3 hr. PR: M.E.M. 112. Fundamentals of mechanical design. Analysis of stress, deformation and failure modes. Rational design and selection of mechanical elements. Theory of lubrication and wear. Problem formulation and optimization of solutions. 3 hr. rec.

136. *Engineering Systems Design.* 3 hr. PR: M.E.M. 134, 182. Identification and solution of challeging engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis. 6 hr. lab.

140. *Engineering Thermodynamics.* 3 hr. PR: Physics 12, Math. 17. First and second laws of thermodynamics; energy equations; properties of gases and vapors; availability and thermodynamic relations. 3 hr. rec.

141. *Engineering Thermodynamics.* 3 hr. PR: M.E.M. 140. Continuation of M.E.M. 140. Gas and vapor cycles, mixtures of gases and vapors, chemical reactions, introduction to fluid mechanics. 3 hr. rec.

144. *Thermodynamics of Fluids.* 3 hr. PR: M.E.M. 140. The dynamics and thermodynamics of fluids. Integral formulation of basic laws for closed and open systems and control volumes. Effects of heat conduction, viscosity, and compressibility on free and boundary flows. 3 hr. rec.

170. *Mechanical Engineering Analysis.* 3 hr. PR or Conc.: Math. 18. Numerical and graphical techniques applied to the solution of mechanical engineering problems. Analog and digital computer programming. Data analysis. 2 hr. rec., 3 hr. lab.

180. *Mechanical Engineering Measurements.* 3 hr. PR: M.E.M. 140. Static and dynamic measurements of pressure, temperature, force, stress, displacement, etc. Calibration of instruments and error analysis. 2 hr. rec., 3 hr. lab.

182. *Engineering Systems Laboratory.* 2 hr. PR: M.E.M. 180; PR or Conc.: M.E.M. 134, 144, 250. Experimental evaluation of modern and complex engineering systems. Participation in groups with oral and written presentation of results. 6 hr. lab.

200. *Advanced Mechanics of Materials I.* 3 hr. PR: M.E.M. 52 or consent. Theories of failure and design procedures; time and temperature dependent behavior; shear center, unsymmetrical bending, curved beams. 3 hr. rec.

204. *Dynamics of Physical Systems.* 3 hr. PR: M.E.M. 52 and Math. 18 or consent. Physical systems such as hydraulic, mechanical, electrical, electromechanical, electrohydraulic, hydromechanical, and thermodynamic considered. Emphasis on the modeling of compound systems and studying their natural behavior using analytical techniques. Use of computers in analysis of physical systems.

210. *Kinematics.* 3 hr. PR: M.E.M. 112 and Math. 18 or consent. Geometry of constrained motion, kinematics synthesis and design, special linkage. Coupler curves, inflection circle, Euler-Savary equation, cubic of stationary curvature and finite displacement techniques. 3 hr. rec.

222. *Mechanical Vibrations.* 3 hr. PR: Math. 18, M.E.M. 112, or consent. Fundamentals of vibration theory. Free and forced vibration of single and multiple degree of

freedom systems. Solution by Fourier and Laplace transformation techniques. Transient analysis emphasized. Energy methods. 3 hr. rec.

232. *Introduction to Feedback Control.* 3 hr. PR: Math. 18, E.E. 105 or M.E.M. 204 or consent. Fundamentals of automatic control theory. Transfer functions and block diagrams for linear physical systems. Proportional, integral, and derivative controllers. Transient and frequency response analysis using Laplace transformation.

236. *Systems Analysis of Space Satellites.* 3 hr. PR: Senior standing. Introduction to engineering principles associated with analysis and design of space satellites. Emphasis on the interdisciplinary nature of satellite systems analysis. 3 hr. rec.

238. *Introduction to Underwater Engineering.* 3 hr. PR: Consent. Underwater portion of our world with emphasis on science and technology. Emphasis on economic and social needs for maritime resources, maritime law, and public policy, as well as general and basic engineering aspects of underwater communication, navigation, and structures.

240. *Problems in Thermodynamics.* 3 hr. PR: M.E.M. 141 or consent. Thermodynamic systems with special emphasis on actual processes. Problems presented are designed to strengthen the background of the student in the application of the fundamental thermodynamic concepts. 3 hr. rec.

242. *Bioengineering.* 3 hr. Introduction to human anatomy and physiology using an engineering systems approach. Gives engineering student basic understanding of the human system so that the student may include it as an integral part of the design.

244. *Introduction to Gas Dynamics.* 3 hr. PR: M.E.M. 144 or consent. Basic fundamentals of gas dynamics, one-dimensional gas dynamics and wave motion, methods of measurement, effect of viscosity and conductivity, and concepts from gas kinetics. 3 hr. rec.

250. *Heat Transfer.* 3 hr. PR: M.E.M. 140 or 101. Steady state and transient conduction. Thermal radiation. Boundary layer equations and forced and free convection are also covered. 3 hr. rec.

254. *Applications in Heat Transfer.* 3 hr. PR: M.E.M. 250. For students desiring to apply basic heat transfer theory and digital computation techniques to problems involving heat exchangers, power plants, electronic cooling, manufacturing processes, and environmental problems.

262. *Internal Combustion Engines.* 3 hr. PR: M.E.M. 101 or 141. Thermodynamics of internal combustion engine; Otto cycle; Diesel cycle, two- and four-cycle engines, fuels, carburetion and fuel injection; combustion; engine performance, supercharging. 3 hr. rec.

264. *Heating, Ventilating, and Air Conditioning.* 3 hr. PR: M.E.M. 141 or consent. Methods and system of heating, ventilating, and air conditioning of various types of building, types of controls and their application. 3 hr. rec.

282. *Engineering Acoustics.* 3 hr. PR: Math. 18 or consent. Basic theory of sound propagation and transmission. Identification of important industrial noise sources and sound measurement equipment. Selection of appropriate noise criteria and control methods. Assessment of noise abatement technology. Laboratory studies and case histories.

290. *Seminar.* 1-6 hr. PR: Junior, senior, or graduate status, and consent.

294. *Special Topics.* 1-6 hr. PR: Junior, senior, or graduate status, and consent.

299. *Special Problems.* 1-6 hr. PR: For junior, senior, and graduate students.

301. *Advanced Engineering Acoustics.* 3 hr. PR: M.E.M. 282 or consent. Study of complex sound generation and the propagation, transmission, reflection, and absorption of air-borne and structure-borne sound. Coupling of sound and vibration in structures. Acoustical behavior and characteristics of materials.

305. *Analytical Methods in Engineering I.* 3 hr. PR: Consent. Index notation for determinants, matrices, and quadratic forms; linear vector spaces, linear operators including differential operators; calculus of variations, eigenvalue problems, and boundary value problems.

306. *Analytical Methods in Engineering II.* 3 hr. PR: M.E.M. 305 or at least two semesters of advanced calculus. Intended for advanced graduate students interested in modern analysis for engineering applications. Linear operators for continuous systems.

307. *Non-Linear Analysis in Engineering.* 3 hr. PR: Consent. Special topics in non-linear analysis of various types of engineering systems. Various numerical, approximate, and analytical techniques chosen to suit the needs and interests of advanced graduate students.

310. *Advanced Mechanics of Materials II.* 3 hr. PR: Consent. Beams on elastic support, cylindrical shells with bending, torsion of noncircular members, two-dimensional applications in elasticity, contact stresses, and simple problems in plates and shells. 3 hr. rec.

312. *Inelastic Behavior of Engineering Materials.* 3 hr. PR: M.E.M. 51, 52 and consent. Characterization and modeling of typical engineering materials, elastic, visco-elastic, and plastic materials, design considerations.

316. *Energy Methods in Applied Mechanics.* 3 hr. PR: Consent. Variational principle of mechanics and applications to engineering problems; principles of virtual displacements, minimum potential energy, and complementary energy. Castigliano's theorem, Hamilton's principle. Applications to theory of plates, shells, and stability. 3 hr. rec.

318. *Continuum Mechanics.* 3 hr. PR: M.E.M. 51, 52. Emphasizes the basic laws of physical behavior of continuous media. Analysis of stress; equations of motion and boundary conditions; kinematic analysis; rates of strain, dilatation and rotation; bulk time, rates of change; constitutive equations with special attention to elastic bodies and ideal fluids; energy equations and the first law of thermodynamics. 3 hr. rec.

320. *Theory of Elasticity I.* 3 hr. Cartesian tensors; equations of classical elasticity, energy, minimum, and uniqueness theorems for the first and second boundary value problems; St. Venant principle; extension, torsion, and bending problems. 3 hr. rec.

322. *Advanced Vibrations I.* 3 hr. PR: M.E.M. 222 or consent. Dynamic analysis of multiple degree of freedom discrete vibrating systems. Lagrangian formulation, matrix and numerical methods, impact and mechanical transients.

325. *Experimental Stress Analysis.* 3 hr. PR: M.E.M. 51, 52. Classical photoelasticity, brittle lacquers, birefrigent coatings, strain gage techniques and instrumentation, as applied to problems involving static stress distributions. 2 hr. rec., 3 hr. lab.

330. *Instrumentation in Engineering I.* 3 hr. PR: Consent. Theory of measuring systems, emphasizing measurement of rapidly changing force, pressure, strain, temperature, vibration, etc. Available instruments, methods of noise elimination, types of recording studied. Special value to students in experimental research. 2 hr. rec., 3 hr. lab.

333. *Advanced Machine Design.* 3 hr. PR: M.E.M. 200 or consent. Design for extreme environments, material selection, lubrication and wear, dynamic loads on cams, gears, and bearings, balancing of multi-engines and rotors, electromechanical components.

340. *Advanced Thermodynamics I.* 3 hr. PR: M.E.M. 141. First and second laws of thermodynamics with emphasis on the concept of entropy production. Application to a variety of nonsteady open systems, thermodynamics of multiphase, multicomponent and reacting systems. Criteria for equilibrium and stability.

342. *Advanced Thermodynamics II.* 3 hr. PR: M.E.M. 340 or consent. Continuation of topics related to reactive systems. Adiabatic flame temperatures, reaction kinetics, conservation of species equations, flame propagation and detonation.

344. *Statistical Thermodynamics.* 3 hr. PR: M.E.M. 340 or equiv. Microscopic thermodynamics for Boltzmann, Bose-Einstein, and Fermi-Dirac statistics. Schrodinger wave equation, partition functions for gases and solids.

348. *Heat Transfer.* 3 hr. PR: Undergraduate course in heat transfer or consent. Graduate course in heat transfer primarily for mechanical engineering students. Topics include one-, two-, and three-dimensional thermal conduction involved in mechanical processes both for constant and time varying temperature fields, free and forced convection in heat exchangers, heat power equipment and aircraft and radiative heat transfer between surfaces and absorbing media as found in furnaces, industrial processes, and aerospace applications.

350. *Conduction Heat Transfer.* 3 hr. PR: M.E.M. 250 or consent. Analytical, numerical, graphical, and analog solutions of steady and non-steady heat conduction problems in isotropic and anistropic solids. Thermal properties, extended surfaces, thermal stress, interphase conduction with moving interface, localized and distributed sources.

352. *Intermediate Dynamics.* 3 hr. PR: M.E.M. 52. Newtonian and Lagrangian mechanics. Dynamics of discrete systems and rigid bodies analyzed utilizing Newtonian and Lagrangian formulations.

353. *Advanced Dynamics I.* 3 hr. PR: M.E.M. 352 or consent. Analytical mechanics. Stability of autonomous and non-autonomous systems considered and analytical solutions by perturbation techniques introduced. Hamilton-Jacobi equations developed. Problems involving spacecraft, gyroscopes and celestial mechanics studied.

354. *Convection Heat Transfer.* 3 hr. PR: M.E.M. 250 or consent. Laminar and turbulent flows. Analytical, numerical, and analogical solution. Selected topics study of current research publications.

355. *Radiation Heat Transfer.* 3 hr. PR: M.E.M. 250 or consent. Classical derivation of black body radiation laws; grey body and non-grey analysis; radiant properties of materials, radiant transport analysis, specular-diffuse networks, gas radiation, thermal radiation measurements; analytical, numerical solutions, and study of selected current publications.

360. *Fluid Mechanics I.* 3 hr. PR: M.E.M. 144 or equiv. Advanced dynamics and thermodynamics of fluids. Basic laws of conservation of mass and momentum in differential, vector, and integral forms. Application to internal flows, fluid machinery, and structures.

364. *Turbomachinery.* 3 hr. PR: M.E.M. 101 or 141. Flow problems encountered in design of water, gas, and steam turbines, centrifugal and axial flow pumps and compressors, design parameters.

384. *Feedback Control in Mechanical Engineering.* 3 hr. PR: M.E.M. 232 or consent. Control analysis of hydraulic and pneumatic closed-loop systems including spool valves, flapper valves, pumps, servomotors, and electrohydraulic servomechanisms. Investigation of nonlinearities by phase plane, Liapunov, and describing function techniques. Programming for analog and digital computer simulation. Introduction to fluidic elements and logic circuits.

394. *Special Topics.* 1-6 hr. For senior and graduate students.

399. *Special Problems.* 1-6 hr. For senior and graduate students. Offered each term.

College of Human Resources and Education

If you enjoy working with people to help them realize their potential, the College of Human Resources and Education will prepare you for a career in such fields as counseling, dietetics, home economics, speech pathology and audiology, special education, and teaching.

The College is organized into three areas — the Division of Clinical Studies, the Division of Education and the Division of Family Resources. Degrees in every teaching field — from childhood education to secondary school specializations — are offered through the Division of Education. The most modern instructional facilities strengthen the specialized programs provided by the Division of Clinical Studies. Students in the Division of Family Resources may study in such fields as textiles and clothing, nutrition and foods, and housing and design.

All programs lead to certification and licensure in teaching or to graduate work. The College believes that a strong liberal arts background is necessary for students to benefit fully from its programs. So students spend part of their first two academic years taking such liberal arts courses as literature, economics, history, mathematics, and courses in the natural and physical sciences. Students preparing for teaching careers also are exposed to classroom teaching.

WVU publishes *The Individual Psychologist,* the journal of the American Society of Adlerian Psychology, which is edited by Prof. Manford A. Sonstegard in the Division of Clinical Studies.

Admission

Requirements for admission to the undergraduate programs of the College of Human Resources and Education are listed by Divisions in subsequent pages of this *Catalog.* Candidates for bachelor's degrees in Home Economics and in Speech Pathology and Audiology may enter these programs during the freshman year.

Students who enter the Division of Education must have completed a minimum of 58 semester hours with a grade-point average of at least 2.25 on all work attempted. These candidates register for their first two years of work in the College of Arts and Sciences. Freshmen and sophomores who expect to enter the Division of Education, College of Human Resources and Education, will indicate their intention when they register. Their studies will be directed by advisers for pre-education students. Such students should so arrange their courses of study so as to satisfy requirements for junior standing and should be fulfilling requirements for certification of teachers.

Complete information concerning WVU admissions, registration, fees and expenses, regulations, etc. may be obtained in Part 2 of this *Catalog.*

Faculty

William G. Monahan, Ed.D. (Mich. St. U.), *Dean of the College of Human Resources and Education and Professor.*

Arthur N. Hofstetter, Ed.D. (U. Va.), *Associate Dean for Teacher Education and Professor.*

Ernest R. Goeres, Ph.D. (U. Iowa), *Assistant to the Dean and Assistant Professor.*

Division of Clinical Studies

Glen M. Baquet, M.S. (WVU), *Instructor.*
Peter Belch, M.A. (WVU), *Instructor (part-time).*
Thomas L. Blaskovics, Ph.D. (U. Wisc.), *Associate Professor.*
William H. Cormier, Ed.D. (U. Tenn.), *Associate Professor.*
Rosemary Dauterive, M.A. (LSU), *Instructor.*
James S. DeLo, Ph.D. (U. Pitt.), *Associate Professor.*
Lawrence Erickson, Ph.D. (U. Wisc.), *Associate Professor.*
Marilyn Fairbanks, Ph.D. (WVU), *Assistant Professor.*
Phyllis M. Goldy, M.S. (U. Houston), *Instructor.*
Kathryn Greever, Ed.D. (WVU), *Research Associate.*
Thomas C. Hatcher, Ph.D. (Ohio St. U.), *Associate Professor.*
Edward Jacobs, Ph.D. (Fla. St. U.), *Assistant Professor.*
Judy Rae Kelley, M.S. (WVU), *Instructor (part-time).*
Eddie C. Kennedy, Ed.D. (Ind. U.), *Professor.*
Norman J. Lass, Ph.D. (Purdue U.), *Associate Professor.*
Thomas P. Lombardi, Ed.D. (U. Ariz.), *Associate Professor.*
Glen P. McCormick, Ph.D. (Purdue U.), *Associate Professor.*
Ranjit K. Majumder, Ph.D. (U. Okla.), *Associate Porfessor; Director of Research, Research and Training Center.*
Deborah M. Marano, M.S. (WVU), *Instructor.*
Robert L. Masson, Ed.D. (SUNY), *Associate Professor; Chairperson of Rehabilitation Counseling and Counseling and Guidance.*
Ann L. Meissner, Ph.D. (U. Wisc.), *Associate Professor.*
Joseph B. Moriarty, Ph.D. (Fordham U.), *Associate Professor; Director of Research and Training Center.*
Gabriel A. Nardi, Ph.D. (U. Wisc.), *Associate Professor.*
Robert H. Neff, Ed.D. (WVU), *Professor; Chairperson of Special Education.*
L. Sherrilyn Nye, Ph.D. (Purdue U.), *Assistant Professor.*
Michael Oliverio, M.A. (WVU), *Instructor (part-time).*
John Panza, M.A. (WVU), *Instructor (part-time).*
Evelyn Raber, M.A. (WVU), *Instructor (part-time)*
Wilbert E. Rankin, M.S. (U. Pitt.), *Associate Professor.*
Stanley H. Rude, Ed.D. (WVU), *Research Associate.*
Martin Saltz, Ph.D. (U. Conn.), *Associate Professor.*
Manford A. Sonstegard, Ph.D. (Northwestern U.), *Professor.*
David J. Srebalus, Ed.D. (Ind. U.), *Associate Professor.*
Charles K. Stuart, Ed.D. (U. No. Colo.), *Associate Professor.*
Rebecca Supler, M.S. (U. Pitt.), *Assistant Professor.*
Susanna M. Waddell, M.S. (WVU), *Instructor (part-time)*
Michael T. Yura, Ph.D. (Ohio St. U.), *Assistant Professor.*
Dolores Zoldos, Ed.D. (WVU), *Assistant Professor*

Division of Education

John O. Andes, Ed.D. (U. Fla.), *Associate Professor.*
Benjamin H. Bailey, Ed.D. (U. Fla.), *Associate Professor.*
Sheldon R. Baker, Ed.D. (West. Res. U.), *Associate Professor.*
Patrick E. Balch, A.B. (Chico St. C.), *Assistant Professor.*
Robert D. Baldwin, Ph.D. (Cornell U.), *Professor Emeritus.*
Laddie R. Bell, Ed.D. (U. Va.), *Professor; Coordinator of Graduate Cooperative Programs.*
Walter S. Bower, Ph.D. (WVU), *Assistant Professor; Coordinator of Student Teaching Experiences — Wood County.*

Dorwin L. Bowman, II, M.Ed. (No. Tex. St.), *Instructor.*
Thomas J. Brennan, Ed.D. (Bradley U.), *Professor Emeritus.*
John L. Carline, Ph.D. (Syracuse U.), *Associate Professor; Chairperson of Curriculum and Instruction.*
Michael A. Caruso, M.A. (WVU), *Assistant Professor; Adviser for Off-Campus Students.*
Wincie A. Carruth, Ph.D. (NYU), *Professor.*
Urban Couch, M.F.A. (Cranbrook Acad. Art), *Professor.*
Gloria J. Cunningham, M.S. (WVU), *Instructor.*
Paul W. DeVore, Ed.D. (Penn. St. U.), *Professor; Coordinator of Technology Education.*
J. William Douglas, Ph.D. (Ohio St. U.), *Associate Professor; Chairperson of Physical Education.*
Glenn D. Elliott, M.S. (WVU), *Instructor.*
Mildred E. Fizer, M.S. (U. Wisc.), *Instructor.*
Lawrence E. Fraley, Ed.D. (U. So. Calif.), *Assistant Professor.*
Richard C. Franklin, Ed.D. (Columbia U.), *Professor.*
Michael F. Gates, Ed.D. (WVU), *Assistant Professor.*
Wilson I. Gautier, Ed.D. (WVU), *Associate Professor.*
Mary Jane Glasscock, M.M. (WVU), *Instructor.*
Ernest R. Goeres, Ph.D. (U. Iowa), *Assistant Professor; Assistant to the Dean.*
Harold I. Goodwin, Ph.D. (U. Calif.), *Professor; Chairperson of Education Administration.*
James G. Harlow, Ph.D. (U. Chicago), *Professor.*
Arthur N. Hofstetter, Ed.D. (U. Va.), *Professor; Associate Dean for Teacher Education.*
Boyd D. Holtan, Ed.D. (U. Ill.), *Professor.*
Frederick J. Holter, Ph.D. (N.Y.U.), *Professor Emeritus.*
Leo Horacek, Ph.D. (U. Kan.), *Professor.*
Ronald V. Iannone, Ed. D. (U. Syracuse), *Associate Professor.*
Warren G. Kelley, Ed.D. (U. Mo.), *Associate Professor.*
J. Dan Knifong, Ph.D. (U. Ill.), *Assistant Professor.*
Robert L. Kurucz, Ph.D. (Ohio St. U.), *Associate Professor.*
Betty Joe Lambert, M.A. (Marshall U.), *Instructor; Coordinator of Student Teaching Experiences — Kanawha County.*
Donald P. Lauda, Ph.D. (Iowa St. U.), *Associate Professor.*
Sara Logan, M.A. (WVU), *Instructor.*
Betholene F. Love, M.S. (U. Okla.), *Professor.*
Rogers McAvoy, Ph.D. (Ind. U.), *Professor; Chairperson of Educational Psychology.*
David McCrory, M.A. (Kent State U.), *Assistant Professor.*
Paul R. McGhee, Ph.D. (Syracuse U.), *Assistant Professor; Director of Field Experiences.*
O. Claude McGhee, Ph.D. (Ohio St. U.), *Associate Professor.*
William R. McGraw, Ph.D. (U. Minn.), *Professor; Chairperson of Drama.*
C. Everett Marcum, H.S.D. (Ind. U.), *Professor; Chairperson of Safety Studies.*
James A. Martin, Ed.D. (U. Tenn.), *Associate Professor.*
Harold Mehrens, Ed.D. (U. Md.), *Adjunct Assistant Professor.*
Delmas F. Miller, Ph.D. (U. Pitt.), *Professor Emeritus.*
William G. Monahan, Ed.D. (Mich. St. U.), *Professor; Dean of the College of Human Resources and Education.*
Roy A. Moxley, Ph.D. (U. Mich.), *Assistant Professor.*

John Mullenex, Ph.D. (WVU), *Instructor.*
Joseph A. Murphy, Ph.D. (Ohio St. U.), *Associate Professor.*
C. Kenneth Murray, Ph.D. (Ohio St. U.), *Associate Professor.*
Patricia A. Obenauf, Ed.D. (U. Va.), *Assistant Professor.*
Anne A. Nardi, Ph.D. (WVU), *Assistant Professor.*
Franklin Parker, Ed.D. (Geo. Peabody C.), *Benedum Professor.*
John J. Paterson, Ed.D. (Mich. St. U.), *Associate Professor.*
Perry Phillips, Ed.D. (WVU), *Assistant Professor.*
Mary Alice Semon, M.A. (WVU), *Assistant Professor.*
John Semon, M.S. (WVU), *Associate Professor.*
Edwin R. Smith, Ed.D. (WVU), *Assistant Professor.*
Patricia N. Smith, B.S. (Ind. U., Pa.), *Instructor.*
James Snyder, M.A. (Geo. Peabody U.), *Adjunct Assistant Professor.*
Michael Tseng, Ed.D. (Ind. U.), *Professor.*
Susan B. Tucker, B.S. (WVU), *Instructor.*
Ernest Vargas, Ph.D. (U. Pitt.), *Associate Professor.*
Julie S. Vargas, Ph.D. (U. Pitt.), *Associate Professor.*
Charles E. Wales, Ph.D. (Purdue U.), *Professor.*
Robert A. Walker, M.S. (WVU), *Instructor.*
Richard T. Walls, Ph.D. (Penn. St. U.), *Associate Professor.*
Harry G. Wheat, Ph.D. (Columbia U.), *Professor Emeritus.*
Mary L. Yeazell, Ed.D. (U. Ill.), *Associate Professor.*
C. Peter Yost, Ph.D. (U. Pitt.), *Professor; Dean of School of Physical Education*

Division of Family Resources

Gladys R. Ayersman, M.S. (WVU), *Assistant Professor.*
Sylvia C. Bluhm, M.Ed. (Boston U.), *Instructor, Extension Specialist — Women's Program.*
Sara Ann Brown, Ph.D. (Iowa St. U.), *Professor Emeritus.*
Jon Crowell, M.A. (Troy St. U.), *Adjunct Instructor; Regional Training Officer*
Montelle Dietrich, M.S. (U. Colo.), *Associate Professor Emeritus.*
Maridee Dugger, M.S. (WVU), *Instructor*
Wanda K. Franz, M.S. (WVU), *Instructor.*
Babette Graf, M.S. (Penn. St. U.), *Associate Professor.*
Audrey G. Guthrie, M.S. (Cornell U.), *Assistant Professor; State Extension Specialist — Consumer Education and Home Management.*
Joann P. Guthrie, M.S. (WVU), *Instructor.*
William H. Hagerty, M.A. (WVU), *Instructor.*
Mary K. Hymes, M.S. (U. Hawaii), *Instructor.*
Mary Rose Jones, M.S. (WVU), *Associate Professor.*
Nora MacDonald, M.S. (Iowa St. U.), *Instructor.*
Reva Belle Neely, M.S. (Colo. St. U.), *Associate Professor.*
Betty Lou Ramsey, M.S. (Colo. St. U.), *Associate Professor.*
Dottie D. Rauch. M.Ed. (Penn. St. U.), *Instructor.*
Nancy Reese, M.A. (St. U. Iowa), *Instructor (part-time).*
Carolyn C. Sears, M.S. (WVU), *Director, University Laboratory Nursery School.*
John A. Shultz, Ph.D. (Ohio St. U.), *Professor; Chairperson of Family Resources.*
Carl B. Taylor, Ph.D. (Penn. St. U.), *Professor.*
Patricia P. Tursi, Ph.D. (SUNY), *Associate Professor.*
Mary A. Ware, M.S. (U. Nebr.), *Adjunct Instructor; Regional Training Officer.*
Ruth E. Weibel, M.S. (U. Tenn.), *Associate Professor.*
Janice I. Yeager, M.S. (U. Ill.), *Assistant Professor.*

Division of Clinical Studies

Special Education

The Department of Special Education undergraduate program is a teacher preparation program. Its major goals are to train students to become highly competent teachers of the mentally retarded and to provide multiple opportunities for the understanding of new and innovative methodological techniques. The program is offered as a subject specialization in combination with the program for Elementary School Teachers, Grades 1 through 6, or the program for Secondary School Teachers, Grades 7 through 12.

West Virginia urgently needs trained personnel in all phases of education of handicapped children and youth. Recent state legislation mandated counties to provide services for all the handicapped school-aged population of the state. The Special Education program currently offers federal and state traineeships at the senior level for selected undergraduate students.

SPECIALIZATION FOR THE MENTALLY RETARDED, GRADES N-12*

Required Courses	*Hr.*
Sp. Ed. 250. Survey of Exceptional Children and Adults	3
Sp. Ed. 255. Introduction to Mental Retardation	3
Sp. Ed. 260. Curriculum and Methods for Special Education	3
Sp. Ed. 262, 281, or approved elective	3
Sp. Ed. 280. Student Teaching Clinical Experience in Special Education	3
SPA 250. Survey of Oral Communication Disorders	3
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*Students who wish to be certified to teach the mentally retarded children and youth will earn 3 semester hours of student teaching at the elementary or secondary level and 3 semester hours in a program for the mentally retarded.

Special Education

Sp.Ed.

250. *Survey of Exceptional Children and Adults.* I, II, S. 3 hr. PR: Consent. Introduction to all areas of exceptionality. Definition, psychological and educational characteristics, and social and vocational adjustment.

255. *Introduction to Mental Retardation.* I, II, S. 3 hr. PR: Consent. Historical, etiological, social, educational, and vocational aspects of mental retardation.

260. *Curriculum and Methods for Special Education.* I, II, S. 3 hr. PR: Sp. Ed. 250, 255 and/or consent. Organization of instruction, adaptation of teaching methods in several curricula areas and construction of materials.

262. *Curriculum and Methods for the Trainable Mentally Retarded.* I, II, S. 3 hr. PR: Sp. Ed. 250, 255 and/or consent. Special problems of curriculum development for the trainable child and adult and provisions for development of original construction of curricula materials.

271. *Curriculum, Materials, and Methods for Mentally Gifted.* I, II, S. 3 hr. History and philosophy, identification, curriculum, materials and methods.

280. *Student Teaching Clinical Experience in Special Education.* I, II, S. 1-6 hr. PR: Consent. Student teaching with the mentally retarded.

281. *Special Problems and Workshop in Special Education.* I, II, S. 2-4 hr. PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other topics.

Speech Pathology-Audiology

The WVU program in Speech Pathology-Audiology (SPA) is committed to preparing speech and hearing specialists with baccalaureate degrees. A high percentage of students completing the undergraduate program in speech and hearing pursue immediately advanced training in speech pathology or audiology, either at WVU or in other comparable programs.

The SPA program offers students practical experience in (1) Monongalia County public schools, and (2) a community-type speech and hearing clinic on the WVU campus.

Employment opportunities for speech and hearing specialists are extremely favorable, as are opportunities for support in graduate study. The Speech Pathology-Audiology program, because of its affiliation with the American Speech and Hearing Association, encourages *all* its baccalaureate students to continue graduate study in speech pathology or clinical audiology.

General Requirements (B.S. in Speech Pathology-Audiology)

1. Fulfill the WVU Core Curriculum requirements.

2. Present a total of 128 academic hours, including 58 upper-division hours, 8 hours of general biology, 3 hours of general psychology, and 15 hours in related areas.

3. Complete a minimum of 38 hours in SPA of which 6 hours must be in audiology, 3 hours in basic speech communication and hearing science, and 200 clock hours in clinical practicum.

4. For continuation toward a degree after the third semester of enrollment, the student must maintain an overall grade-point average of 2.25, and an average in the major area of 2.5 or better after completing 9 hours of SPA courses, as well as exhibit the personal and professional qualities predictive of success in the profession.

5. A speech evaluation is required for all SPA freshman and transfer students. All communications to SPA students are posted in the Speech and Hearing Clinic and must be read regularly by all SPA students.

Undergraduate Program

Undergraduate students may major in Speech Pathology-Audiology. During the first two years, the program consists of fulfilling the requirements of the WVU Core Curriculum; students take biology as the laboratory science and, as time permits, elect courses in psychology and speech. They also take the survey course in speech correction (SPA 50) in the sophomore year.

During the junior and senior years, undergraduates take a variety of specialized courses beginning with offerings such as phonetics and voice science, proceeding through speech pathology, hearing problems, and other courses relating to communication disorders, and concluding with clinical practice. They also take related courses in psychology and education and sufficient electives to comprise the hours required for their degree. A typical sequence of

courses in Speech Pathology-Audiology includes, in addition to SPA 50, courses numbered SPA 152, 153, 154, 156, 157, 158, 241, 251, 252, 253, and 282.

SUGGESTED DISTRIBUTION OF COURSES FOR BACHELOR OF SCIENCE DEGREE IN SPEECH PATHOLOGY-AUDIOLOGY

First Year

Courses to satisfy Core Curriculum
Biology 1 and 2
Psychology 1

Second Year

Continuation of Core Courses
SPA 50, 153, 156, 241

Third Year

SPA courses including 2 hours of SPA 282 (clinical practicum for which SPA 50, 153, 156, 241 are prerequisites)
Psychology or other related area*
Complete Core or Teacher Certification requirements

Fourth Year

SPA courses including 4 hours of SPA 282
Related area electives

*Third- and fourth-year psychology and related area courses will be selected from offerings approved by the student's adviser, and selected from the related area courses applicable toward clinical certification.

Upon completion of the program, students are eligible for a Bachelor of Science degree and complete the necessary undergraduate work that enables them to undertake graduate study in the field.

The bachelor's program is designed to provide a background in speech and hearing science, speech pathology, audiology and related content areas.

In order to receive credit for SPA 282, students will complete 200 clock hours of supervised clinical practice in the clinics and public schools.

The SPA program enables the student to obtain provisional certification in "speech and hearing therapy" as defined in the 1964 *Standards for Accreditation* bulletin of the West Virginia Board of Education, provided that the student fulfilled the academic course requirements for the general studies curriculum and took the National Teachers Examination. Permanent state certification and eligibility for membership and certification by the American Speech and Hearing Association requires completion of a graduate degree program.

Speech Pathology-Audiology

SPA

50. *Speech Correction.* I, II. 3 hr. For majors in speech pathology-audiology. Fundamentals of evaluation and therapeutic techniques of various oral communication disorders. Normal speech and language development emphasized.

152. *Basic Speech and Hearing Science.* I, II. 4 hr. Application of the physical and social sciences to an understanding of the process of human oral communication.

153. *Applied Phonetics.* I, II. 3 hr. Standard speech sounds in our language. Use of symbols for recording speech sound; application of such symbols in representing various usages of speech; special emphasis on analyzing and recording defective speech. Dynamic concepts studied.

154. *Anatomy of the Speech and Hearing Mechanism.* I, II. 3 hr. Anatomical and physiological study of the vocal mechanisms and the ear.

156. *Articulation and Voice Disorders.* I, II, S. 3 hr. PR: SPA 50 or 250. Detailed consideration of articulation and voice disorders including speech and language retardation and esophageal speech from an etiological, diagnostic, and therapeutic point of view. Diagnostic and therapeutic procedures with these disorders will be developed.

157. *Hearing Problems.* I, II. 3 hr. PR: SPA 50 or consent. General orientation to the field of audiology and the specialties which are included. Problems of the hearing-handicapped, basic hearing instruments, measurement procedures, and general goals of hearing therapy.

158. *Bases of Aural Rehabilitation for Children and Adults.* I. 3 hr. PR: SPA 157. Perceptive and behavioral problems of aurally handicapped individuals in society; alleviating and compensating for hearing loss.

220. *Introduction to Audiology.* I. 4 hr. PR: Consent. The gross anatomy and physiology of the auditory mechanism; physics of acoustic signal production; introduction to basic audiometric techniques and interpretation.

222. *Hearing Conservation.* I. 2 hr. PR: SPA 220 or consent. Investigation of trauma (varied) on auditory sensitivity and acuity; identification audiometry; approaches to hearing conservation.

223. *Aural Rehabilitation.* II. 3 hr. PR: SPA 220 or consent. The rehabilitative approaches to management in the auditorially handicapped individual. Medical, audiological and social aspects of rehabilitation. Procedures of speech reading and auditory training examined and evaluated.

241. *Problems in Speech Pathology.* I, II. 3 hr. PR: Consent. The speech pathologist as a diagnostician and therapist in interdisciplinary investigations. Counseling procedures, administrative practices in varied settings, and organization of programs of various pathologies of speech.

250. *Survey of Oral Communication Disorders.* I, II. 3 hr. (Non-majors). PR: Consent. Basic concepts and principles of the disorders of speech and their treatment. Orientation course for students majoring in speech communication as well as teachers, school administrators, psychologists, and rehabilitation workers.

251. *Advanced Speech Correction.* I, II. 3 hr. PR: SPA 156. The speech-retarded child and organically based speech disorders, including cleft palate, voice disorders, and language disorders in children.

252. *Stuttering.* II, S. 3 hr. PR: SPA 156. Theories and therapies of stuttering.

253. *Profound Organic Speech Disorders.* I, II. 3 hr. PR: SPA 251 or consent. Speech and language disorders related to cerebral injury. Aphasia and cerebral palsy.

263. *Preschool Deaf Child.* I, S. 3 hr. PR: SPA 157. Importance of early detection and education, language development of congenitally deaf child, and parents' role in early childhood education.

281. *Special Topics.* I, II, S. 1-6 hr. per sem.; max. credit 6 hr. PR: Consent, Independent study in speech pathology, audiology, and speech and hearing sciences.

282. *Clinical Practice in Speech.* I, II, S. 1-6 hr. PR: Consent. Supervised diagnosis and therapy of speech disorders. (May be taken for a maximum of 3 semester hours per semester of undergraduate or graduate credit.)

283. *Clinical Practice in Hearing.* I, II, S. 1-6 hr. PR: Consent. Supervised diagnosis and therapy of hearing disorders. (May be taken for a maximum of 3 semester hours per semester of undergraduate or graduate credit.)

Division of Education

The Division of Education prepares students for the education professions. Many advances have been made in developing good learning conditions for children and youth. The teacher and other education professionals are designing and operating educational systems to provide these optimum learning opportunities. The prospective teacher is influenced as much by the way the classes are taught as by *what* is taught. The program at WVU emphasizes individual learning, flexible schedules, student decisionmaking, small group interaction, and the teacher as a human being.

In the self-instruction laboratory, students work as individuals or in small groups of their own choosing. When students feel they have mastered the particular concepts or techniques, they ask to be tested. If found proficient, they go on to other tasks; if not, they continue work in the laboratory, at their own pace and at their own convenience.

Simulation techniques are employed using specially developed films. The student assumes the role of the teacher observing classroom conditions which may prevail and makes decisions at certain critical points. The student then sees the consequences of a decision as portrayed by an actual classroom under similar conditions. The student, classmates, and professor then discuss the situation and the results.

Micro-teaching is utilized to enable the student to teach small groups of peers and children for short periods of time. The teaching is recorded by audio or video-tape so that the student may view the teaching and analyze alone or with others. Students also have direct experiences with youngsters working as teacher-aides, tutors, community-center workers, and student teachers.

The University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary teachers, secondary teachers, school service personnel, and school administrators, with the Doctor of Education as the highest degree approved.

Orientation and Selection

To assist students in choosing a career in the area of teaching and to maintain adequate standards for admission to teacher-training, the Division of Education requires all students pursuing teacher-education programs to participate in and complete satisfactorily the Orientation and Selection Program. The student is enrolled in this program prior to or concurrently with the first course taken in the Division of Education. The transfer student who has completed the first course in education at another institution is required to complete the requirements of the Orientation and Selection Program at WVU.

West Virginia Board of Education Regulation For Teacher Certification

The West Virginia Board of Education requires that 100 of the 128 semester hours required for certification shall be completed in regularly scheduled campus courses. The 28 hours of permissible nonresidence courses may be earned by extension, home study (correspondence), radio, television, special examination, and/or military service.

Renewal of Professional Certificates

All courses for renewal of professional certificates are selected in terms of the teacher's objectives for the improvement of instruction and must be recommended by the county superintendent on a form. The student should have this completed form when registering.

Graduation Requirements

To be eligible for recommendations for the degrees of Bachelor of Science in Secondary Education or Bachelor of Science in Elementary Education, a candidate must:

1. Comply with the general regulations of the University concerning entrance, advanced standing, classification, examination, marks, grade points, etc.
2. Satisfy the following requirements:
    a. Complete the required courses and the minimum number of hours of approved elective courses in education, if any.
    b. Select and pursue subject specialization(s) for the B.S. in Secondary Education or the B.S. in Elementary Education.
    c. Adhere to the patterns prescribed in completing the subject specialization(s).
    d. Present a minimum of 128 hours, if in Secondary Education, and 129 hours, if in Elementary Education, of approved college credit. A general average of C as described under "General Requirements for Certification" must be attained for the above total hours. (Math. 2 will not be counted toward meeting the total hours for graduation.) Forty-five of these credits must be upper-division courses.
    e. Complete 26 hours after enrolling in the Division of Education.
    f. Be at least 18 years of age, of good moral character, interested in education work, and mentally, physically, and otherwise qualified to perform the duties of a teacher.

Fulfillment of the requirements for graduation from the Division of Education, College of Human Resources and Education, qualifies a candidate to apply for recommendation for a West Virginia professional certificate.

The College may require appropriate standardized tests of its graduates.

Requirements for Temporary Certificates For Grades N, K-6, 1-9 or 7-12

A temporary certificate, valid for one year, may be issued to applicants who meet the following requirements:

1. Graduate and be recommended by the Dean of the College of Human Resources and Education.
2. Complete three-fourths of the teaching specialization(s).
3. Complete three-fourths of professional education, including student teaching and methods.
4. Complete three-fourths of the diversified concentration for grades 1-9.
5. Scholarship level expected of regular teacher-education students.

Reciprocal Certification Agreements

West Virginia, at the time of publication, has reciprocal agreements on teacher certification with twenty-three other states. Any inquiries relevant to reciprocity in certification can be made with Michael A. Caruso, Student Advising and Records, 508 Allen Hall.

General Requirements for Professional Certificates

West Virginia University standards for admission to the teacher education program should not be confused with the minimum state standards for certification. Admissions standards for elementary and secondary education are set forth on pages herein.

To teach in the public schools of West Virginia, one must hold a certificate issued by the West Virginia State Department of Education. Before any WVU applicant is eligible to receive a professional certificate the applicant must have: (1) met the minimum state requirements, (2) met the University degree requirements, (3) been recommended by the Dean of the College of Human Resources and Education as herein prescribed, and (4) taken the National Teachers Examination (the commons and the appropriate teaching area).

The College will inform each of its students who is a prospective teacher, and any other prospective teacher, upon request, of the requirements for certification, and will assist in preparing a program of study to meet these requirements. It is the obligation of the student who desires such counsel to arrange a conference some time before the end of the sophomore year.

A candidate for certification is required to achieve a grade-point average of 2.0 (C) or better as follows: (1) on the total of college credits earned; (2) on the hours earned in education; (3) in student teaching; and (4) in each subject specialization.

The State Department of Education uses a system of calculating grade-point averages for certification purposes which differs in some respects from WVU's system. All course work attempted at WVU and at other institutions of collegiate grade will be considered. If a student earns a grade of D, F, or U on any course taken no later than the semester or summer session when he has attempted a total of 60 semester hours, and if he repeats this course one time only, the first grade shall be disregarded for the purpose of determining the student's grade-point average and the second grade earned shall be used. (Effective only for students entering college study for the first time in the First Semester of 1968, and thereafter.)

The Division of Education employs the State Department of Education's system of calculating grade-point averages only for purposes of admission to the Division of Education, for admission to student teaching, and for assessing teaching field and education averages. Academic performance and eligibility for graduation will be assessed by the system employed by WVU which is to count only work taken at WVU each time attempted.

The Dean of the College recommends candidates for professional certificates only after the completion of work for the baccalaureate degree. To be eligible for recommendation by the University for any professional certificate, the applicant must have done student teaching under the supervision of the College.

At least 45 semester hours of upper-division work, WVU standards, are required for all teaching certificates. The qualifications herein prescribed are minimum, not optimum or maximum, and must be met by all candidates.

PROGRAM FOR ELEMENTARY SCHOOL TEACHERS, GRADES 1-9

Requirements for the Degree of Bachelor of Science in Elementary Education and for Recommendation for the Professional Certificate, Grades 1-9

Lower-Division Work

In preparing for admission to the Division of Education and the work of preparing for teaching at early childhood and elementary levels, students will register in their freshman and sophomore years in the pre-education program of the College of Arts and Sciences and pursue the program of general education that the State Board of Education has prescribed for all students who seek recommendation for teaching certificates. This program of prescribed work is included in the "Program for Elementary Education Teachers, Grades 1-9."

Upper-Division Work

For admission to the prescribed courses in Elementary Education, students must register the final two years in the Division of Education. The following will be required:

1. Must have completed 58 semester hours of approved college work.
2. A grade-point average of 2.25 on all work attempted for enrollment in the student teaching block.

In lower-division work students should pursue the lower-division required courses, so that the greatest possible number of hours taken during the junior and senior years may be courses given upper-division credit.

To become eligible for recommendation for the degree of Bachelor of Science in Education and for the Professional Certificate, Grades 1-9, the student must complete the required curriculum and plan of work with a grade-point average of 2.0 (C) or better, as follows: (1) on the total of college credits earned; (2) on the hours earned in education; (3) in the subject specialization; and (4) in student teaching; and the student has been enrolled in the Division of Education for at least 26 semester hours of work, including a minimum of 8 semester hours in student teaching and methods taken at WVU.

PROGRAM FOR UNDERGRADUATE ELEMENTARY EDUCATION

GRADES 1-9

Required Courses		*Required Sem. Hr.*
	Sophomore Year	
	C&I 7. Orientation and Selection	2
	Junior Year	
	Ed. Psych. 105. Human Growth and Development	3
	Ed. Psych. 106. Human Growth and Development	3
Block* Scheduled Same Semester	C&I 120. Reading and Language Arts in the Elementary School	3
	C&I 130. Mathematics in the Elementary School	2
	C&I 140. Science in the Elementary School	2
	C&I 150. Social Studies in the Elementary School	2
	Senior Year	
Block* Scheduled Same Semester	C&I 100. Introduction to Elementary Education	3
	C&I 187. Student Teaching in the Elementary School	8
	C&I 287. Advanced Student Teaching	4
		32

PROGRAMS FOR ELEMENTARY SCHOOL TEACHERS, GRADES 1-9, AND/OR N, K-6

		Required Sem. Hr.
LANGUAGE ARTS		18
English 1, 2. Composition and Rhetoric	6	
Sp. Com. 11. Prin. of Human Comm. and		
Sp. Com. 12 or 13 or 14 Lab **or**		
Drama 50. Oral Interpretation	3	
English 35, 36. Types of Literature* **or**		
English 135, 136. Introduction to Literature*	6	
Lib. Sci. 203. Library Materials for Children	3	

*Students wishing a subject specialization in Language Arts should not take English 35, 36, or 135, 136. See subject specialization for Language Arts.

SOCIAL SCIENCE		24-27
Hist. 1, 2. Western Civilization **or**		
Humanities 1, 2. Introductory General Course**	6	
Soc. Sci. 1, 2. Introductory General Course** **or**	6	
Econ. 51. Principles of Economics **and**	(3)	
Pol. Sci. 2. American Federal System **and**	(3)	9
S.A. 1. Introduction to Sociology	(3)	
Hist. 52, 53. Growth of the American Nation	6	
Hist. 153. West Virginia **or**		
Hist. 261. Econ. and Social Devel. of W. Va	3	
Geog. 7. Physical Geography **or**		
Geog. 8. Human Geography **or**		
Geog. 109. Economic Geography	3	

**Students wishing a subject specialization in Social Science should take Hist. 1, 2 and Econ. 51, Pol. Sci. 2 and S.A. 1. See subject specialization for Social Science.

SCIENCE		16
Biol. 1, 2. General Biology	8	
Phys. Sci. 1, 2. Physical Science***	8	

***Students wishing a subject specialization in Science should not take Physical Science. See subject specialization for Science.

MATHEMATICS		12
Math. 33, 34. Introductory Math for Elementary Teachers	6	
Math. 131. Structure of the Real Numbers	3	
Math. 132. Informal Geometry for Elementary Teachers	3	

MUSIC		7
Music 30. Appreciation of Music	3	
Music 41. Music As an Art and Science****	2	
Music 42. Music Materials and Procedures****	2	

***Students wishing a subject specialization in Music should not take Music 41, 42. See subject specialization for Music.

ART		7
Art 1. Creative Expression in the Fine Arts*	2	
Art 2. Creative Expression in the Applied Arts*	2	
Art 30. Appreciation of the Fine Arts	3	

*May not be taken by students specializing in this field. See specific subject specialization.

		Required Sem. Hr.	
HEALTH AND PHYSICAL EDUCATION			6
	P.E. 41, 42. Physical Education for Elementary Teachers	2	
	P.E. 43. Phys. Ed. for Elementary Teachers	2	
	Health Ed. 101. The Elementary School Health Program	2	
EDUCATION			32
	C&I 7. Orientation and Selection	2	
	Ed. Psych. 105. Human Growth and Development	3	
	Ed. Psych. 106. Human Development and Learning	3	
Pre Student Teaching Block	C&I 120. Reading and Language Arts in the Elementary School	3	
	C&I 130. Mathematics in the Elementary School	2	
	C&I 140. Science in the Elementary School	2	
	C&I 150. Social Studies in the Elementary School	2	
Student Teaching Block	C&I 187. Student Teaching in Elementary School	8	
	C&I 100. Introduction to Elementary Education	3	
	C&I 287. Student Teaching (Advanced)	4	

SUBJECT AND EARLY CHILDHOOD SPECIALIZATIONS

The Professional Certificate, Grades 1-9, *must be endorsed* with at least one subject specialization for teaching in grades 1 through 9. The Professional Certificate must be endorsed with the early childhood specialization for teaching at the kindergarten or pre-school level. Below are listed the categories of work for each. For each subject specialization suggested, University courses to implement the state recommendations are listed. The listed courses have been suggested by the departments concerned and approved by the College.

SUBJECT SPECIALIZATIONS FOR GRADES 1 THROUGH 9

ART (Specialization) Grades 1-9		24
Required Courses		18
Art 11. Basic Drawing	2	
Art 30. Appreciation of Fine Arts	3	
Art 113. Painting	3	
Art 121. Fundamentals of Design	3	
Art 126. Sculpture	3	
Art/C&I 165. Art Education in Elementary Schools	3	
Approved Electives		6
Art 12. Basic Drawing	3	
Art 105 or 106. Survey of Art	3	
Art 114. Painting	3	
Art 122. Fundamentals of Design	3	
Art 127. Sculpture	3	
Art 130. Printmaking	3	
Art 140. Ceramics	3	

		Required Sem. Hr.
HOME ECONOMICS — Grades 1-9		24
Required Courses		
Textiles and Clothing		6
TC 22. Principles of Clothing Construction TC 27. Textiles for Consumers TC 121. Clothing for the Family	any two	6
Foods; Institution Administration		3
FIA 55. Food Principles and Practices	3	
Child Development and Family Relations		6
CDFR 142. Child Development II, **or**		
CDFR 246. Adolescent Development	3	
CDFR 144. Introduction to Marriage and the Family **or**		
CDFR 245. Family Development	3	
HOME MANAGEMENT AND FAMILY ECONOMICS		3
HMFE 161. Family Economics, **or**		
HMFE 165. Home Management, Principles and Application	3	
Housing and Design		3
HD 31. Introduction to Design **or**		
HD 33. Housing Design **or**		
HD 133. Interior Design I	3	
Nutrition		3
NTR 71. Introduction to Human Nutrition **or**		
NTR 175. Food and People	3	
MODERN FOREIGN LANGUAGES — Grades 1-9*		
FRENCH		24
Required Courses		
French 1, 2. Elementary French	6	
French 3, 4. Intermediate French	6	
French 103, 104, 109. Advanced French	9	
L.T.M. 221. Language Teaching Methods	3	

*Students who have been excused from elementary or intermediate courses will take additional work to satisfy the total semester hour requirement.

GERMAN		24
Required Courses		
German 1, 2. Elementary German	6	
German 3, 4. Intermediate German	6	
German 103, 104, 109. Advanced German	9	
L.T.M. 221. Language Teaching Methods	3	
FOREIGN LANGUAGES		
RUSSIAN		24
Required Courses		
Russian 1, 2. Elementary Russian	6	
Russian 3, 4. Intermediate Russian	6	
Russian 103, 104. Advanced Russian	6	
Russian 144, 145. Survey of Russian Literature	6	

	Required Sem. Hr.
SPANISH	24
Required Courses	
Spanish 1, 2. Elementary Spanish	6
Spanish 3, 4. Intermediate Spanish	6
Spanish 103, 104, 109. Advanced Spanish	9
L.T.M. 221. Language Teaching Methods	3
LATIN	24
Required Courses	
Latin 1, 2. Elementary Latin	6
Latin 3. Intermediate Latin	3
Latin 4. Cicero's Orations	3
Humanities 101. Classical Culture in the Modern World	3
Latin 109. Selections from Roman Prose	3
Latin 110. Selections from Roman Poetry	3
Latin 121. Survey of Latin Literature	3
LANGUAGE ARTS — Grades 1-9	33
Required Courses	
English 1, 2. Composition and Rhetoric*	6
English 111. The English Language	3
Lib. Sci. 203. Library Materials for Children*	3
Sp. Com. 11. Prin. of Human Com. and Sp.Com. 12 or 13 or 14 **or** Drama 50. Oral Interpretation*	3
English 150. Shakespeare	3
English 21 or 121. Survey: English Literature**	3
English 22 or 122. Survey: English Literature**	3
English 24, 25. American Literature**	6
English 125. World Literature **or** Humanities 141 or 142. Great Books	3

*Included in the program of General Requirements.
**These courses waive and supersede English 35, 36 and 135, 136 in the program of General Requirements.

MATHEMATICS — Grades 1-9	21-23
Required Courses	15-16
Math. 33, 34. Intro. Math. for Elemen. Teachers	6
Math. 131. Structure of the Real Numbers	3
Math. 132. Informal Geometry for Elemen. Teachers	3
Math. 133. Intro. Modern Algebra for Teachers **or** Math. 333, 334. Foundations of Algebra, 4 hr.	3-4
Approved Electives	6-7
Math. 241. Introduction to Linear Algebra	3
Math. 335, 336. Foundations of Geometry, 4 hr. **or** Math. 138. Modern Geometry for Teachers, 3 hr.	
Math. 28. Finite Mathematics	3
Comp. Sci. 1. Introduction to Computer Science	3

		Required Sem. Hr.
MUSIC — Grades 1-9		24
Required Courses		
Music 30. Appreciation of Music*	3	
Music 44, 47. (Woodwind or Percussion)	1	
Music 51. Conducting	2	
Music 61, 62, 63, 64. Written and Aural Theory	8	
Music 100, 102, 103, 105. (Band, Choral, Orchestra, Choir)	2	
Music 110. Applied Music (Including at least 1 hour in Voice and 1 hour in Piano)	5	
Music 152. Music Education — Elementary	3	

*Included in program of General Requirements.
NOTE: Music 41, 42 are not required and do not fulfill requirements for Music as a subject specialization.

PHYSICAL EDUCATION — Grades 1-9		20
Required Courses		
Saf. S. 70. First Aid and Emergency Allied Services	2	
Dance 39. Folk and Ballroom Dance	2	
P.E. 43. Physical Ed. for Elemen. Teachers	2	
P.E. 71. Orientation in Physical Ed.	2	
P.E. 164. Kinesiology	3	
P.E. 177. Philos. and Princ. of Phys. Ed.	3	
P.E. 61. (Women) Gymnastics	2	
P.E. 51. (Men) Gymnastics and Volleyball	2	
P.E. 31 or 32 or 54 or 63 or 64 (Women)	2	
P.E. 31. Soccer and Track and Field	2	
P.E. 32. Basketball and Softball	2	
P.E. 54. Individual and Dual Sports	2	
P.E. 63. Field Hockey and Volleyball	2	
P.E. 64. Archery, Bowling, and Fencing	2	
P.E. 53 or 54 or 64 (Men)	2	
P.E. 53. Soccer and Wrestling	2	
P.E. 54. Individual and Dual Sports	2	
P.E. 64. Archery, Bowling, and Fencing	2	

SCHOOL LIBRARIAN — Grades 1-9*		21
Required Courses		
Lib. Sci. 201. Reference and Bibliography	3	
Lib. Sci. 203. Library Materials for Children*	3	
Lib. Sci. 205. Selection of Books and Related Materials for the Secondary School Library	3	
Lib Sci. 222. Field Practice	3	
Lib. Sci. 223. Cataloging and Classification	3	
Lib. Sci. 235. Organization and Administration of the Instructional Materials Center in the Elementary School	3	
Ed. Psych. 260. Audio Visual Resources for Instruction	3	

*For certification grades K-12, Lib. Sci. 107 must also be taken.

SCIENCE — Grades 1-9		31
Required Courses		
Biol. 1, 2. General Biology*	8	
Chem. 11, 12. General Chemistry**	8	

	Required Sem. Hr.
Physics 1, 2. Introductory General Courses**	8
Physics 106. Descriptive Astronomy	3
Geol. 5. Introduction to Geology **and**	
Geol. 2. Physical Geology Laboratory	4
Suggested Additional Courses	
Forestry 140. West Virginia's Natural Resources	3
Biol. 252. Flora of West Virginia	3

*Included in the program of General Requirements.
**These courses waive and supersede Physical Science 1, 2 in the program of General Requirements.

SOCIAL STUDIES — Grades 1-9 33

Required Courses	27
Hist. 1, 2. Western Civilization*	6
Hist. 52, 53. Growth of the American Nation*	6
Hist. 153. West Virginia*	3
Econ. 51. Principles of Economics** **and**	
Pol. Sci. 2. American Federal System** **and**	
S.A. 1. Introduction to Sociology**	9
Geog. 7. Physical Geography* **or**	
Geog. 8 Human Geography* **or**	
Geog. 109. Economic Geography*	3
Elective Courses	6

Six semester hours, in addition to courses taken in the General Studies program, are to be chosen from one of the five areas below:

Hist. Any 6 hours of History (with adviser's approval)	6
Econ. 52. Principles of Economics	3
and one additional course	3
S.A. Any 6 hours of Sociology and Anthropology	6

*Included in the program of General Requirements.
**These courses waive and supersede Soc. Sci. 1, 2 in the program of General Requirements.

SPECIALIZATION FOR THE MENTALLY RETARDED — Grades N-12* 18

Required Courses	
Sp. Ed. 250. Survey of Exceptional Children and Adults	3
Sp. Ed. 255. Introduction to Mental Retardation	3
Sp. Ed. 260. Curriculum and Methods for the Educable Mentally Retarded	3
Sp. Ed. 262 or 265 or 281 or Reading 283	3
SPA 250. Survey of Oral Communication Disorders **or**	
Sp. Com. 275. Communication Problems of Children	3
Sp. Ed. 280. Student Teaching Clinical Experience in Special Education	3

*Students who wish to be certified to teach the mentally retarded children and youth will earn 3 semester hours of student teaching at the elementary level and 3 semester hours in a program for the mentally retarded.

SPEECH COMMUNICATION — Grades 1-9 21

Pol. Sci. 1. Elements of Democratic Government	3
Pol. Sci. 120. State and Local Government	3
Pol. Sci. 160. International Relations	3
Pol. Sci. 221. W. Va. Government and Administration	3
Geog. 7. Physical Geography* **or**	

	Required Sem. Hr.
Geog. 8. Human Geography* **or**	
Geog. 109. Economic Geography	
and one additional course	3
Required Courses	
Sp. Com. 106 or 131. Nonverbal Common Language Behavior	3
Sp. Com. 11 and 12. Prin. of Human Comm. and Lab	3
Sp. Com. 80. Introduction to Broadcasting	3
Drama 50. Oral Interpretation*	3
SPA 250. Survey of Oral Communication Disorders **or**	
SP. Com. 275. Speech Problems of Children	3
Drama 282. Creative Dramatics (May substitute Drama	
180 or 284)	3
Sp. Com. or Drama Elective	3

*Included in program of General Requirements one of which has been selected.

EARLY CHILDHOOD EDUCATION — Grades N-6*

Required Courses		18
CDFR 141. Child Development I	3	
CDFR 142. Child Development II	3	
CDFR 244. Family and Individual in Community	3	
C&I 210. Early Childhood Education	3	
C&I 211. Early Childhood Education	3	
Sp. Com. 375. Speech Problems of Children **or**		
SPA 250. Survey of Oral Communication Disorders	3	

*Students who wish to be certified in Early Childhood Education, N-6, will do student teaching at the nursery school-kindergarten and elementary school levels. Students electing this subject specialization will not be eligible to teach in junior high school unless a subject specialization, grades 1-9, is also elected.

PROGRAMS FOR PROFESSIONAL CERTIFICATES JUNIOR AND SENIOR HIGH SCHOOL

Requirements for the Degree of Bachelor of Science in Secondary Education and for Recommendation for the Professional Certificate, Grades 7-12

Lower-Division Work

In preparing for admission to the College of Human Resources and Education and the work of preparing for teaching in the junior and senior high school, students will register for the freshman and sophomore years in the College of Arts and Sciences and pursue their prescribed program in preparation for teacher certification under the direction of the pre-education adviser.

Upper-Division Work

Upon completing 58 semester hours of approved college work a student is eligible to enter the College of Human Resources and Education. To become eligible for recommendation for the degree of Bachelor of Science in Education and for the Professional Certificate, Grades 7-12, the student must complete the requirements described in the General Requirements for the Professional Certificate. The College will lend guidance and advice to students in any other department of the University who desire secondary teacher certification.

An overall grade-point average of 2.25 is required for admission to student teaching.

		Required Sem. Hr.
1. GENERAL STUDIES		50-58
Required Courses		
HUMANITIES		21
English 1, 2. Composition and Rhetoric	6	
Sp. Com. 11. Prin. of Human Comm. and Sp. Com 12, or 13, or 14	3	
or		
Drama 50. Oral Interpretation	3	
English 35, 36. Types of Literature* **or** English 135, 136. Introduction to Literature*	6	
Art 30. Appreciation of the Fine Arts	3	
Music 30. Appreciation of Music	3	

*Students who qualify for certification in the field of English or in Language Arts will take English 21, 22 (or 121, 122) and 24, 25 instead of English 35, 36 or English 135, 136.

SCIENCE		8-10
Any one of the following full-year sequences:		
Biol. 1, 2. General Biology	8	
Chem. 11, 12. Survey of Chemistry	8	
Chem. 15, 16. Fundamentals of Chemistry	8	
Geol. 1, 2, 3, 4. Physical and Historical Geology and Laboratory	8	
Physical Sci. 1, 2. Introductory General Course*	8	
Physics 1, 2. Introductory Physics	8	
Physics 11, 12. General Physics	8	

*Physical Science 1 and 2 should not be taken by any student who intends to have a teaching field in any one of these sciences.

MATHEMATICS		4
Math. 15. Calculus I **or** Math. 21, 22. Introduction to Mathematics	4	
SOCIAL STUDIES**		12-15
Hist. 1, 2. Western Civilization **or** Humanities 1, 2. Introductory General Course	6	
Econ. 51. Principles of Economics **and** Pol. Sci. 2. American Federal System	9	
S.A. 1. Introduction to Sociology **or** Soc. Sci. 1, 2. Introductory General Course	6	

**Students who plan to qualify in the field of Social Sciences should take Hist. 1 and 2 and courses in economics, political science, and sociology.

PHYSICAL AND HEALTH EDUCATION		4
Men: Two semesters of course work chosen from the following:		
P.E. 1, 2	2	
Dance 5 through 18	2	
Women: Two semesters of course work chosen from the following:		
P.E. 1 through 25	2	
Dance 5 through 18	2	
Health Ed. 102	2	

		Required Sem. Hr.
PROFESSIONAL EDUCATION — SECONDARY		
Required Courses		23
Foundation for Teaching		8
C&I 7. Introduction to Education	2	
Ed. Psych. 105. Human Development & Learning	3	
Ed. Psych. 106. Human Development & Learning	3	
Teaching Methods in Area of Specialization		3
Select one below related to teaching field:		
C&I 160. Vocational Agriculture	3	
Music 151 (C&I 167). Music Education I, Methods	3	
Music 152 (C&I 168). Music Education II, Methods	3	
P.E. 130 (C&I 174). Physical Education	3	
C&I 175 or H.E.Ed. 175. Home Economics	3	
H.E.Ed. 178. Home Economics	3	
C&I 280. Workshop in:	3	
Sec. 01. Language Arts (English, Journalism, Speech Communication, and Library Science)		
Sec. 02. Math		
Sec. 03. Science		
Sec. 04. Social Studies		
L.T.M. 221 (C&I 125). Language Teaching Methods	3	
Art 166 (C&I 166). Art Ed. in Second. Sch.	3	
General Methods and Practicum		12
C&I 104. Principles of Teaching Secondary Schools	4	
C&I 188. Student Teaching **or** C&I 187 and 188 (4 sem. hr. each)	8	
C&I 287. Student Teaching Clinical Experience	2-4	
Sp.Ed. 280. Student Teaching	3	

2. TEACHING FIELDS — Grades 7-12 (students must take one comprehensive field or two non-comprehensive fields.)

VOCATIONAL AGRICULTURE — Comprehensive		45-47
Required Courses — Core Program		28
Agr. Econ. 104. Farm Management	3	
Agr. Econ. 180. Assigned Topics	3	
Agr. Educ. 162. Group Organization and Leadership	2	
Agr. Mech. 152. Shop Theory and Methods	3	
Agr. Mech. 253. Advanced Farm Machinery	3	
AIVS 51. Principles of Animal Science	4	
Agron. 2. Principles of Soil Science	4	
Agr. 11, 12. Professions in Agriculture	2	
Plant Sci. 52. Principles of Plant Science	4	

Agricultural education majors will satisfy requirements in mathematics by completing Math. 3.

Areas of Agricultural Minors (select one)

A. Agricultural Production and Management		18
Required Courses		15
Agr. Econ. 231. Marketing Agricultural Products	3	
An. Prod. 108. Animal Production Experience, **or**		
An. Prod. 145. Mild Production, **or**		
An. Prod. 138. Grading and Selection of Meat and Meat Animals, **or**		
An. Prod. 141. Beef Production, **or**		
An. Prod. 146. Sheep Production	6	

	Required Sem. Hr.
F.M. 132. Farm Woods Management	3
Hort. 242. Small Fruit Production, **or**	
Agron. 254. Pasture and Forage Crops	3
Approved Electives	3
Agr. Econ. 231, 330; Ag. Mech. 253, 259, 270, 275, 352; Agron. 210, 250; An. Nutrn. 101; Bact. 141; Food Sci. 134; Hort. 115, 117, 204; Plant Path. 201; Vet Sci. 102.	
B. Animal Processing	17
Required Courses	10
Food Sci. 106. Poultry Products Technology	2
Food Sci. 112. Dairy Technology	3
Food Sci. 134. Judging Dairy Products	2
Food Sci. 167. Meats	3
Electives	7
An. Nutrn. 101; An. Physiol. 280; An. Prod. 138, 141, 145, 146, 240; Bact. 141; Food Sci. 107; Vet. Sci. 102.	
C. Agricultural Mechanics	17
Required Courses	12
Agr. Mech. 152. Shop Theory and Methods	3
Agr. Mech. 259. Farm Structures	3
Agr. Mech. 270. Electricity in Agriculture	3
Agr. Mech. 275. Agricultural Engines	3
Electives	5
Agr. Mech. 253, 352; I.E. 6, 7, 8.	
D. Agricultural Sales and Services	18
Agr. Econ. 10. Agribusiness Accounting	3
Agr. Econ. 231. Marketing Agricultural Products	3
Agr. Econ. 235. Marketing Dairy Products	3
Agr. Econ. 240. Agricultural Prices	3
Agr. Econ. 261. Agribusiness Finance	3
Agr. Econ. 330. Cooperative Organization	3
E. Conservation	17
Required Courses	12
Agron. 212. Soil Conservation and Management	3
For. 140. West Virginia Natural Resources	3
F.M. 132. Farm Woods Management	3
Hort. 229. Landscape Design	3
Electives	5
Agron. 210, 250; Biol. 51; F.M. 12, 151, 211; R.P. 40, 142.	
F. Horticulture Produce Industry	17
Hort. 107. General Horticulture	3
Hort. 180. Assigned Topics	2
Hort. 242. Small Fruits	3
Hort. 243. Physiology of Vegetables	3
Hort. 244. Handling and Storage of Horticultural Crops	3
Hort. 245. Greenhouse Management	3

	Required Sem. Hr.	
G. Ornamental Horticulture		19
Required Courses	13	
Agron. 250. Turfgrass Management	3	
Hort. 107. General Horticulture	3	
Hort. 116. Flower Judging	1	
Hort. 204. Plant Propagation	3	
Hort. 245. Greenhouse Management	3	
Electives		6
Agron. 210; Biol. 169; Hort. 160, 229.		
ART (To be combined with another specialization)		45
Required Courses		39
Art 11, 12. Basic Drawing	6	
Art 105, 106. Survey of Art	6	
Art 113, 114. Painting	6	
Art 121, 122. Fundamentals of Design	6	
Art 126, 127. Sculpture	6	
Art 130. Printmaking	3	
Art 140. Ceramics	3	
Art/C&I 166. Art Education in the Secondary School	3	
Approved Electives		6
Art 131. Printmaking	3	
Art 141. Ceramics	3	
Art 151. Special Problems	3	
Art 211. Figure Drawing	3	
Art 250 or 260. Art before 1900 **or** Art after 1900	3	
ART (1-12, Single Comprehensive)		63
Two Dimensional Studio and Design	30	
Art 11, 12. Drawing	6	
Art 113, 114. Painting	6	
Art 117, 118. Painting, Intermediate	6	
Art 211. Figure Drawing	3	
Art 121. Fundamentals of Design	3	
Art 130. Printmaking	3	
Art 140. Ceramics	3	
Three Dimensional Studio and Design	12	
Art 122. Fundamentals of Desing	3	
Art 125, 127. Modeling-Sculpture	6	
Art (Advanced Studio Elective)	3	
Art History and Theory	15	
Art 105, 106. Survey of Art	6	
Art 250 or 26. Modern Painting	3	
Art/C & I 165 Art Education-Elem	3	
Art/C & I 166 Art Education-Sec.	3	
Electives in Art	6	

	Required Sem. Hr.
Elective (Art)	3
Elective (Creatives Arts Center)	3

ENGLISH (To be combined with another specialization) 39

Required Courses

English 1, 2. Composition and Rhetoric*	6
English 111. The English Language	3
English 21 or 121. Survey: English Literature	3
English 22 or 122. Survey: English Literature	3
English 24, 25. American Literature	6
English 150. Shakespeare	3
American Literature (English 131, 220, 266)	3
Course in a major author or period before 1660 (English 161, 162, 255, 261, 262)	3
Course in a major author or period after 1660 (English 163, 164, 263, 264, 265, 267, 365)	3
Course including foreign literature in English Translation (English 125, 236, 337; Humanities 141, 142)	3
Sp. Com. 11. Prin. of Human Comm. and Sp. Com. 12, or 13, or 14	3
Drama 50. Oral Interpretation*	3

*Included in the program of General Requirements.
NOTE: For students in the English program, the courses in English, American, and foreign literature supersede and waive the requirements of English 35 and 36 or 135 and 136 in General Studies.

MODERN FOREIGN LANGUAGES

FRENCH (To be combined with another specialization) 36

Required Courses

French 1, 2. Elementary French	6
French 3, 4. Intermediate French	6
French 103, 104, 109, 110. Advanced French	12
French 115. The Classical School	3
French 118. Literature of the Nineteenth Century	3
French 217. French Civilization	3
Linguistics 111. Introduction to Structural Linguistics	3

Approved Electives*

French 116. Literature of the Eighteenth Century	3
French 222. French Realism	3
French 231. Phonetics and Pronuncition	3

*These courses may be chosen to complete the 36-hour program of a student who, because of high-school credits, has been excused from the elementary or intermediate courses. They may be substituted for French 118 and 217 with the approval of the adviser.

FRENCH (As a second language specialization)* 24

Required Courses

French 1, 2. Elementary French	6
French 3, 4. Intermediate French	6
French 103, 104, 109, 110. Advanced French	12

	Required Sem. Hr.
Approved Electives**	
French 118. Literature of the Nineteenth Century	3
French 217. French Civilization	3
French 222. French Realism	3

*Students selecting German, Latin, Spanish or Russian as a specialization may qualify for teaching French by completing the 24-semester-hour program.
**These courses may be chosen to complete the 24-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses.

FRENCH (As second field)	30
Required Courses	
French 1, 2. Elementary French	6
French 3, 4. Intermediate French	6
French 103, 104, 109, 110. Advanced French	12
Linguistics 111. Introduction to Structural Linguistics	3
Approved Electives*	
French 115. The Classical School	3
French 116. Literature of the Eighteenth Century	3
French 118. Literature of the Nineteenth Century	3
French 217. French Civilization	3
French 231. Phonetics and Pronunciation	3
French 229. Literature of the Sixteenth Century	3

*Sufficient hours should be chosen to complete the 30-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses.

GERMAN (To be combined with another specialization)	36
Required Courses	
German 1, 2. Elementary German	6
German 3, 4. Intermediate German	6
German 103, 104. Advanced German	6
German 105, 106. The German Novelle	6
German 107. Nineteenth Century Drama	3
German 109, 110. Advanced German	6
Linguistics 111. Introduction to Structural Linguistics	3
Approved Electives**	
German 108. Nineteenth Century Drama	3
German 161. Lyric Poetry	3

**These courses may be chosen to complete the 36-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses. They may be substituted for German 106 and 107 with the approval of the adviser.

GERMAN (As a second language specialization)*	24
Required Courses	
German 1, 2. Elementary German	6
German 3, 4. Intermediate German	6
German 103, 104, 109, 110. Advanced German	12
Approved Electives**	
German 106. The German Novelle	3
German 107. Nineteenth Century Drama	3

*Students selecting French, Russian, Latin or Spanish as a specialization may qualify for teaching German by completing the 24-semester-hour program.
**These courses may be chosen to complete the 24-hour program of a student who, because of high-school credits, has been excused from elementary or intermediate courses.

	Required Sem. Hr.
GERMAN (As a second field)	30
Required Courses	
German 1, 2. Elementary German	6
German 3, 4. Intermediate German	6
German 103, 104, 109, 110. Advanced German	12
Linguistics 111. Introduction to Structural Linguistics	3
Approved Electives*	
German 105, 106. The German Novelle	6
German 107, 108. Nineteenth Century Drama	6
German 136. Introduction to Goethe	3
German 242. Faust	3
German 245. Classicism and Romanticism	3
German 246. The Liberal Age	3
German 247. The Age of Crisis	3

*Sufficient hours should be chosen to complete the 30-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses.

RUSSIAN (To be combined with another specialization)	33
Required Courses	
Russian 1, 2. Elementary Russian	6
Russian 3, 4. Intermediate Russian	6
Russian 103, 104. Advanced Russian	6
Russian 144, 145. Survey and Russian Literature	6
Russian 211, 212. The Russian Novel	6
Linguistics 111. Introduction to Structural Linguistics	3
RUSSIAN (As a second language specialization)*	24
Required Courses	
Russian 1, 2. Elementary Russian	6
Russian 3, 4. Intermediate Russian	6
Russian 103, 104. Advanced Russian	6
Russian 144, 145. Survey of Russian Literature	6
Approved Electives**	
Russian 211, 212. The Russian Novel	6

*Students selecting German, French, Latin, or Spanish as a specialization may qualify for teaching Russian by completing the 24-semester-hour program.
**These courses may be chosen to complete the 24-hour program of a student who, because of high-school credits, has been excused from elementary or intermediate courses.

RUSSIAN (As a second field)	30
Required Courses	
Russian 1, 2. Elementary Russian	6
Russian 3, 4. Intermediate Russian	6
Russian 103, 104. Advanced Russian	6
Russian 109, 110. Advanced Russian	6
Russian 144. Survey of Russian Literature	3
Linguistics 111. Introduction to Structural Linguistics	3
Approved Electives*	
Russian 105, 106. The Russian Short Story	6

	Required Sem. Hr.
Russian 145. Survey of Russian Literature	3
Russian 211, 212. The Russian Novel	6

*Sufficient hours should be chosen to complete the 30-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses.

SPANISH (To be combined with another specialization) 36

Required Courses

Spanish 1, 2. Elementary Spanish	6
Spanish 3, 4. Intermediate Spanish	6
Spanish 103, 104, 109, 110. Advanced Spanish	12
Spanish 212. Spanish Literature Since 1870	3
Spanish 216. Spanish Civilization and Culture	3
Spanish 221. Literature of the Golden Age to 1635	3
Linguistics 111. Introduction to Structural Linguistics	3

Approved Electives*

Spanish 211. Nineteenth Century Literature to 1870	3
Spanish 217. Spanish-American Literature and Culture	3
Spanish 222. Golden Age After Lope de Vega	3

*These courses may be chosen to complete the 36-hour program of a student who, because of high-school credits, has been excused from elementary of intermediate courses. They may be substituted for Spanish 212 and 216 with the approval of the adviser.

SPANISH (As a second language specialization)* 24

Required Courses

Spanish 1, 2. Elementary Spanish	6
Spanish 3, 4. Intermediate Spanish	6
Spanish 103, 104, 109, 110. Advanced Spanish	12

*Students selecting French, German, Latin, or Russian as a specialization may qualify for teaching Spanish by completing the 24-semester-hour program.

Approved Electives**

Spanish 212. Spanish Literature Since 1870	6
Spanish 216. Spanish Civilization and Culture	3
Spanish 217. Spanish-American Literature and Culture	3
Spanish 222. Golden Age After Lope de Vega	3

**These courses may be chosen to complete the 24-hour program of a student who, because of high-school credits, has been excused from elementary or intermediate courses.

SPANISH (As a second field) 30

Required Courses

Spanish 1, 2. Elementary Spanish	6
Spanish 3, 4. Intermediate Spanish	6
Spanish 103, 104, 109, 110. Advanced Spanish	12
Linguistics 111. Introduction to Structural Linguistics	3

Approved Electives*

Spanish 211. Nineteenth Century Literature to 1870	3
Spanish 212. Spanish Literature Since 1870	3
Spanish 216. Spanish Civilization and Culture	3
Spanish 217. Spanish-American Literature and Culture	3
Spanish 218. Spanish-American Literature and Culture	3
Spanish 221. Literature of the Golden Age to 1635	3
Spanish 222. Golden Age After Lope de Vega	3

*Sufficient hours should be chosen to complete the 30-hour program of a student who, because of high school credits has been excused from elementary or intermediate courses.

	Required Sem. Hr.
FOREIGN LANGUAGE	
LATIN (To be combined with another specialization)	36
Required Courses	
Humanities 102. Classical Myths in the Modern World	3
Latin 1, 2. Elementary Latin	6
Latin 3. Intermediate Latin	3
Latin 4. Cicero's Orations	3
Latin 109. Selections from Roman Prose	3
Latin 110. Selections from Roman Poetry	3
Latin 121. Survey of Latin Literature	3
Latin 131. Latin Prose Composition	3
Latin 202. Roman Comedy	3
Latin 231. Roman Satire	3
Linguistics 111. Introduction to Structural Linguistics	3
Approved Electives*	
Latin 234. Roman Historians	3
Latin 235. Roman Epic	3

*These courses may be chosen to complete the 36-hour program of a student who, because of high-school credits, has been excused from elementary or intermediate courses. They may be substituted for any of the literature above with the approval of the adviser.

LATIN (As a second language specialization)*	24
Required Courses	
Latin 1, 2. Elementary Latin	6
Latin 3. Intermediate Latin	3
Latin 4. Cicero's Orations	3
Humanities 101. Classical Culture in the Modern World	3
Latin 109. Selection from Roman Prose	3
Latin 110. Selection from Roman Poetry	3
Latin 121. Survey of Latin Literature	3

*Students selecting French, German, Russian, or Spanish as a specialization may qualify for teaching Latin by completing the 24-semester-hour program.

LATIN (As another foreign language field)	24
Required Courses	
Latin 1, 2. Elementary Latin	6
Latin 3. Intermediate Latin	3
Latin 4. Cicero's Orations	3
Latin 109. Selections from Roman Prose	3
Latin 110. Selections from Roman Prose	3
Latin 121. Survey of Latin Literature	3
Linguistics 111. Introduction to Structural Linguistics	3
Approved Electives*	
Latin 131. Roman Prose Composition	3
Latin 202. Roman Comedy	3
Latin 231. Roman Satire	3
Latin 234. Roman Historians	3
Latin 235. Roman Epic	3

*Sufficient hours should be chosen to complete the 24-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses.

		Required Sem. Hr.
Latin (As a second field)		30
Latin 1, 2. Elementary Latin	6	
Latin 3. Intermediate Latin	3	
Latin 4. Cicero's Orations	3	
Latin 109. Selections from Roman Prose	3	
Latin 110. Selections from Roman Prose	3	
Latin 121. Survey of Latin Literature	3	
Latin 265. Roman Public and Private Life	3	
Latin 231. Roman Satire	3	
Linguistics 111. Introduction to Structural Linguistics	3	
Approved Electives*		
Latin 113. Roman Biographers	3	
Latin 114. Roman Elegy	3	
Latin 122. Survey of Latin Literature	3	
Latin 131. Latin Prose Composition	3	
Latin 201. Roman Novelists	3	

*Sufficient hours should be chosen to complete the 30-hour program of a student who, because of high school credits, has been excused from elementary or intermediate courses.

PHYSICAL EDUCATION* (To be combined with another specialization) 48

Theory and Foundations		36
P.E. 71. Orientation in Physical Education	2	
P.E. 72. Historical and Sociological Perspectives of Physical Education	3	
P.E. 74. Psychological Perspectives of Physical Education	3	
P.E. 121. Sport Injury Control and Management	3	
P.E. 125. Movement Education for Children	3	
P.E. 130. (C&I 174). Methods of Teaching Physical Educ.	3	
P.E. 131. Program Assisting	1	
P.E. 154. Sport Coaching	3	
P.E. 164. Kinesiology	3	
P.E. 165. Physiology of Motor Activities	3	
P.E. 177. Philosophy and Principles of Physical Educ.	3	
P.E. 191. Measurement and Evaluation in Physical Educ.	3	
P.E. 192. Organization and Administration of Physical Education	3	
Sport and Movement Analysis		12
Area 1 — One course selected from:		
P.E. 51. Gymnastics and Volleyball	2	
P.E. 61. Gymnastic I	2	
P.E. 62. Advanced Gymnastics II	2	
Area 2 — One course selected from:		
P.E. 52. Aquatics I, II	2	
P.E. 58. Synchronized Swimming I, II	2	
P.E. 124. Water Safety Instructorship I, II	2	
Area 3 — One course selected from:		
P.E. 54. Individual and Dual Sports I, II	2	
P.E. 64. Archery, Bowling, and Fencing I, II	2	
Area 4 — Men — Dance:		
Dance 39. Folk and Ballroom Dance I, II	2	

	Required Sem. Hr.
Women — Dance:	
Dance 39. Folk and Ballroom Dance I, II	2
and one course selected from:	
Dance 35. Theory and Practice of Modern Dance Techniques I, II	2
Dance 37. Advanced Dance Techniques with Principles of Choreography II	1
Area 5 — Men — Two courses selected from:	
P.E. 53. Soccer and Wrestling I	2
P.E. 55. Baseball and Basketball I	2
P.E. 56. Track and Field and Football I, II	
Women — One course selected from:	
P.E. 31. Soccer and Track and Field I	2
P.E. 32. Basketball and Softball II	2
P.E. 63. Field Hockey and Volleyball I	2

*Students who wish to be certified in physical education, grades 1-12, will do student teaching at the elementary and secondary levels.

PHYSICAL EDUCATION, HEALTH AND SAFETY (Comprehensive, 1-12)		72
Physical Education		44
Theory and Foundations		32
P.E. 71. Orientation in Physical Education	2	
P.E. 72. Historical and Sociological Perspectives of Physical Education	3	
P.E. 74. Psychological Perspectives of Physical Education	3	
P.E. 121. Sport Injury Control and Management	3	
P.E. 125. Movement Education for Children	3	
P.E. 130. Methods of Teaching Physical Education	3	
P.E. 164. Kinesiology	3	
P.E. 165. Physiology of Motor Activities	3	
P.E. 177. Philosophy and Principles of Physical Education	3	
P.E. 191. Measurement and Evaluation in Physical Education	3	
P.E. 192. Organization and Administration of Physical Education	3	
Sport and Movement Analysis		12
Area 1 — One course selected from the following:		
P.E. 51. Gymnastics and Volleyball	2	
P.E. 61. Gymnastics I	2	
P.E. 62. Advanced Gymnastics	2	
Area 2 — One course selected from the following:		
P.E. 52. Aquatics I, II	2	
P.E. 58. Synchronized Swimming I, II	2	
P.E. 124. Water Safety Instructorship I, II	2	
Area 3 — One course selected from the following:		
P.E. 54. Individual and Dual Sports I, II	2	
P.E. 64. Archery, Bowling, and Fencing I, II	2	
Area 4 —		
Men — Dance 39	2	
Women — Dance 39 and One course selected from:		
Dance 35. Theory and Practice of Modern Dance Techniques I, II	2	
Dance 37. Advanced Dance Techniques with Principles of Choreography	1	

		Required Sem. Hr.
Area 5 — Men — Two courses selected from:		
P.E. 53. Soccer and Wrestling I	2	
P.E. 55. Baseball and Basketball I	2	
P.E. 56. Track and Field and Football I, II	2	
Women — One course selected from:		
P.E. 31. Soccer and Track and Field I	2	
P.E. 32. Basketball and Softball II	2	
P.E. 63. Field Hockey and Volleyball	2	
Health Education		15
H.E. 50. History and Philosophy of Health Education	3	
H.E. 70. Individual and His Health	3	
H.E. 71. Health in the Community	3	
H.E. 104. Organization and Administration of School Health Program	3	
C&I 280. Methods & Techniques of Teaching Health Education	3	
Safety Studies		13
Saf.S 70. First Aid and Emergency Aid Services	2	
Saf.S. 131. Accident Prevention Control Principles	2	
Saf.S. 231. Safety in Motor Transportation Systems	3	
Saf.S. 251. Driver and Highway Safety Foundations	3	
Saf.S. 254. Teaching Driver and Highway Safety	3	
HOME ECONOMICS (Comprehensive)		40
Required Courses		15
CDFR 144. Introduction to Marriage and the Family	2	
TC 22. Principles of Clothing Construction **OR**	3	
TC 224. Flat Pattern Design	3	
NTR 71. Introduction to Nutrition	3	
HMFE 165. Home Management: Principles & Application	3	
HD 31. Introduction to Design	3	
Restricted Electives (2 courses minimum in each area)		29-30
CDFR		
CDFR 142. Child Development II	3	
CDFR 145. Infant Development	3	
CDFR 245. Family Development	3	
CDFR 246. Adolescent Development	3	
TC		
TC 22. Principles of Clothing Construction	3	
TC 27. Textiles for Consumers	3	
TC 121. Clothing for the Family	3	
TC 224. Flat Pattern Design	3	
TC 225. Tailoring	3	
TC 227. Advanced Textiles	3	
FIA and NTR		
FIA 55. Food Principles and Practices	3	
FIA 151. Meal Management	3	
NTR 175. Food and People	3	
NTR 273. Family and Community Nutrition	3	

	Required Sem. Hr.
HMFE	
HMFE 160. Communication of Consumer Information	2
HMFE 161. Family Economics	3
HMFE 261. Consumer Economics	3
HD	
HD 33. Housing Design	3
HD 133. Interior Design I	3
HMFE 167. Household Equipment	3

INDUSTRIAL ARTS

No new students are being accepted in the undergraduate Industrial Arts program at this time. An extensive curriculum development project is being undertaken for the purpose of establishing a more modern and relevant curriculum model of Industrial Arts for teachers.

JOURNALISM		21
Required Courses		15
Journ. 1. Introduction to Mass Communications	2	
Journ. 18. News Writing	3	
Journ. 19. Copy Editing and Make-up	4	
Journ. 120. Introduction to Photography	2	
Journ. 125. High School Journalism	2	
Journ. 227. History of Journalism	3	
Approved Electives		6
Journ. 10. Visual Communication	3	
Journ. 110. Typography and Printing Processes	3	
Journ. 113. Principles of Advertising	3	
Journ. 118. Reporting	3	
Journ. 141. Advanced Journalism Problems	1-3	
Journ. 182. Broadcast Journalism I	3	
Journ. 228. Law of the News Media	3	
Journ. 230. Editorial and Interpretive Writing	3	

NOTE: All electives listed may be counted towards a Bachelor's Degree in Journalism Education.

LANGUAGE ARTS (Comprehensive)		56
English		36
English 1, 2. Composition and Rhetoric*	6	
English 21 or 121; 22 or 122. Survey: English Literature	6	
English 24, 25. American Literature	6	
English 111. The English Language	3	
English 150. Shakespeare	3	
Course in American Literature (English 131, 220, 235, 266, 283)	3	
Course in a major author or period before 1660 (English 161, 162, 255, 256, 261, 262)	3	
Course in a major author or period after 1660 (English 132, 163, 164, 263, 264, 265, 267, 284, 365)	3	
Course including foreign literature in English translation (English 125, 234, 236, 337; Humanities 141, 142)	3	

	Required Sem. Hr.
Speech Communications	15
Sp. Com. 11 and 12. Prin. of Human Comm. and Lab.	3
Sp. Com. 107. Comm. and Decisions	3
Drama 50. Oral Interpretation*	3
Drama 75. Acting	3
Drama 180. Directing	3
Journalism	5
Journ. 18. News Writing	3
Journ. 125. High School Journalism	2

*Included in the program of General Studies.
NOTE: For the student completing the Language Arts field, the requirements here listed supersede and waive the requirement of English 35 and 36, or 135 and 136, in General Studies.

MATHEMATICS (Comprehensive)	30
Required Courses	
Math. 15, 16, 51. Calculus I, II, III	12
Math. 133. Intro. Algebra for Teachers, 3 hr. **or**	
Math. 333, 334. Foundations of Algebra, 4 hr.	3-4
Math. 241. Introduction to Linear Algebra	3
Math. 138. Modern Geometry for Teachers, 3 hr. **or**	
Math. 335, 336. Foundations of Geometry, 4 hr. **or**	
Math. 271. Projective Geometry, 3 hr.	3-4
Approved Electives	9
A minimum of 6 hr. must be selected from list below including:	
1. Statistics	
2. Numerical Analysis	
3. Logic & Sets	
4. Probability	
Math. 28. Finite Mathematics	3
Math. 168. History of Mathematics	3
Math. 181. Introduction to Analysis and Topology	3
Math. 291. Theory of Probability, 3 hr. **or**	
Math. 321. Introduction to Numerical Analysis	3
Math. 337, 338. Probability and Statistics, 4 hr	3-4
Comp. Sci. 1. Introduction to Computer Science	3
Stat. 101. Elem. Stat. Inference	3
MUSIC (Comprehensive)	74
Required Courses	
Music 61-68. Music Theory	16
Music 44-47 or Music 48. Instrumental Pedagogy	3-7
(The higher number of hours required for instrumental emphasis majors.)	
Music 248. Music Arranging for Public School Groups	2
Music 31, 33, 34. Music Listening, Music History	6
Music 151, 152 (C&I 167, 168). Music Education	6
Music 51. Conducting and Rehearsing	6
Music 100-105. Major Performance Groups	4
(For instrumental emphasis majors, these hours must be in either M. 100 Band or M. 103 Symphony Orchestra. For vocal emphasis majors, these hours must be in either M. 102 Choral Union or M. 105 Choir.)	
Music 240. Clinic Chorus, Band and Orchestra	2-4
(The higher number of hours required for instrumental emphasis majors.)	

	Required Sem. Hr.
Music 110. Applied Music (major performance medium) (Student must achieve grade level 7)	12
Music 110. Applied Music (voice and piano) (Vocal emphasis majors must achieve grade level 3 in voice and grade level 3 in piano. Instrumental emphasis majors must achieve grade level 2 in piano.)	4-6
Required of vocal emphasis majors only:	
Music 49. Vocal Pedagogy	2
Music 19. Introduction to Opera Theatre	2
Required of instrumental emphasis majors only:	
Music 115. Chamber Music	1
Music 100. (Marching band)	1
Electives	5
SAFETY STUDIES*	16
Required Courses	
Saf. S. 70. First Aid and Emergency Allied Services	2
Saf. S. 131. Accident Prevention Control Principles	2
Saf. S. 231. Safety in Motor Transportation Systems	3
Saf. S. 251. Driver and Highway Safety Foundations	3
Saf. S. 254. Teaching Driver and Highway Safety	3
Saf. S. 255. Current Safety Topics and Problems	3

*Approved as a third area of specialization or a second area of specialization with a comprehensive program for grades 7-12.
NOTE: Students with specialization in Safety Education should select Ed. Psych. 260 of their program of Professional Education.

SCHOOL LIBRARIAN**	21
Required Courses*	
Lib. Sci. 201. Reference and Bibliography	3
Lib. Sci. 203. Library Materials for Children	3
Lib, Sci. 205. Selection of Books and Related Materials for the Secondary School Library	3
Lib. Sci. 207. Organization and Administration of the Instructional Materials Center in the Secondary School	3
Lib. Sci. 222. Field Practice	3
Lib. Sci. 223. Cataloging and Classification	3
Ed. Psych. 260. Audio-Visual Resources in Education	3

*Student teaching cannot be done in Library Science but must be in another teaching field.
**For certification grades K-12, Lib. Sci. 235 must also be taken.

SOCIAL STUDIES (Comprehensive	48
History	24
Required Courses	
Hist. 1, 2. Western Civilization*	6
Hist 52. Growth of the American Nation to 1865	3
Hist. 53. Making of Modern America, 1865-Present	3
Hist. 153. West Virginia **or** Hist. 261. Economic and Social Development of W. Va.	3

	Sem. Hr.	Required
Approved Electives		
May include 9 hr. of European History or 6 hr. of European History and 3 hr. of American History**		9
Hist. 105. Modern Europe 1500-1763	3	
Hist. 106. Modern Europe 1763-1871	3	
Hist. 109. Modern Europe 1871-Present	3	
Hist. 155. American Colonial and Revolutionary Exp.	3	
Hist. 157. The Early Republic, U.S. 1781-1861	3	
Hist. 159. The United States, 1865-1918	3	
Hist. 161. Recent America, U.S. Since 1918	3	
Hist. 201. British Civilization to 1660	3	
Hist. 202. British Civilization Since 1660	3	
Government		6
Pol. Sci. 2. The American Federal System*	3	
One of the following:	3	
Pol. Sci. 1. Elements of Democratic Government		
Pol. Sci. 120. State and Local Government		
Pol. Sci. 160. International Relations		
Pol. Sci. 221. W. Va. Govt. and Administration		
Economics		6
Econ. 51. Principles of Economics*	3	
Econ. 52. Principles of Economics	3	
Sociology and Anthropology		6
S.A. 1. Introduction to Sociology*	3	
S.A. 71. Social Problems	3	
Geography		6
Geog. 7. Physical Geography **and/or**	3	
Geog. 8. Human Geography **and/or**	3	
Geog. 109. Economic Geography	3	

*Included in the program of General Studies.
**Students certifying in West Virginia shall include Hist. 153 among their electives.
NOTE: The student who expects to qualify for certification in Social Studies is advised to take the following courses in the program of General Studies: Hist. 1 and 2; economics, sociology, and political science.

SPECIALIZATION FOR THE MENTALLY RETARDED, GRADES 1-12*
(To be combined with another specialization) 18

Required Courses	
Sp. Ed. 250. Survey of Exceptional Children and Adults	3
Sp. Ed. 255. Introduction to Mental Retardation	3
Sp. Ed. 260. Curriculum and Methods for the Educable Mentally Retarded	3
Sp. Ed. 162 or 265 or 281, or Reading 283	3
SPA 250. Survey of Oral Communication Disorders **or** Sp. Com. 275. Communication Problems of Children	3
Sp. Ed. 280. Student Teaching Clinical Experience in Special Education	3

*Students who wish to be certified to teach the mentally retarded children and youth will earn 3 semester hours of student teaching at the secondary level and 3 semester hours in a program for the mentally retarded.

	Required Sem. Hr.
SPEECH COMMUNICATION**	36
Required Courses	
Sp. Com. 106. Non Verbal Com. or 131 — Human Com. and Language Behavior	3
Sp. Com. 11 and 12. Human Com. and Lab	3
Sp. Com. 80. Introduction to Broadcasting	3
Sp. Com. 133. Interpersonal Communication	3
Sp. Com. 107. Communication and Decisions	3
Sp. Com. 181. Radio and Television Announcing	3
Sp. Com. Elective	3
Drama 50. Oral Interpretation*	3
Drama 75. Acting	3
Drama 100. Stagecraft	3
Drama 180. Directing **or** Drama 282. Creative Dramatics	3
Sp. Com. 275. Com. Problems of Children **or** SPA 250. Survey of Oral Communication Disorders	3

*Included in the program of General Requirements.
**Speech Com. 31 and 34 are for students who qualify for certification in the field of Speech. The requirements supersede Speech Com. 3 and 11 in the program of General Studies. Of the drama options, Drama 180 is for teachers certifying for grades 7-12; Drama 282 is for those certifying for grades 5-9.

THE SCIENCES

BIOLOGICAL AND GENERAL SCIENCE (Comprehensive)	57
Required Courses	51
Biol. 1, 2. General Biology*	8
Biol. 101. Animals As Organisms (Physical Education majors take Biol. 266)	4
Biol. 102. Plants As Organisms	4
Biol. 103. Population Biology	4
Biol. 104. Cellular & Molecular Biology	8
Chem. 11, 12. General Chemistry	8
Physics 1, 2. General Physics*	8
Geol. 1. Physical Geology*	1
Geol. 2. Physical Geology Lab*	1
Geol. 3. Historical Geology*	3
Geol. 4. Historical Geology Lab*	1
Physics 106. Descriptive Astronomy	3
Approved Electives	6
For. 140. West Virginia's Natural Resources and/or any 200-level courses in Biology, other than Biol. 209.	

*Included in the program of General Studies.
NOTE: A student who wishes to qualify for a specialization in chemistry, physics or biological science may omit elements of geology and astronomy, but will be required to complete a second specialization.

PHYSICS AND GENERAL SCIENCE (Comprehensive)	47-51
Required Courses	
Physics 1, 2. Introductory Physics* **or** Physics 9, 10. Physics. Problems **or** Physics 11. General Physics*	8-12
Physics 12. Survey of Physics	
Physics 124, 201. Mod. Physics for Engrs.; Spec. Top	6
Chem. 11, 12. Survey of Chemistry*	8

	Required Sem. Hr.
Geol. 1. Physical Geology*	8
Geol. 2. Physical Geology Lab*	1
Geol. 3. Historical Geology	3
Geol. 4. Historical Geology Lab*	1
Physics 106. Descriptive Astronomy	3
Biol. 1, 2. General Biology*	8
Approved Electives	6
Physics 113, 114. Introductory Electronics	6
Physics 116. Photography	3
Physics 117. Descriptive Meteorology	3
Physics 221. Optics	3

*Included in the program of General Studies.
NOTE: A student who wishes to qualify for a specialization in chemistry, physics or biological sciences may omit elements of geology and astronomy, but will be required to complete a second specialization.

CHEMISTRY AND GENERAL SCIENCES (Comprehensive) 46-48

Required Courses

Chem. 15, 16. Fundamentals of Chemistry*	3
Chem. 115. Introductory Analytical Chemistry	3
Chem. 131. Organic Chemistry **or**	
Chem. 133. Organic Chemistry	3-4
Chem. 141. Physical Chemistry	4
Geol. 1. Physical Geology*	3
Geol. 2. Physical Geology Laboratory*	1
Geol. 3. Historical Geology*	3
Geol. 4. Historical Geology Laboratory*	1
Physics 106. Descriptive Astronomy	3
Biol. 1, 2. General Biology*	8
Physics 1, 2. Introduction to Physics*	8

Approved Electives

Geol. 151. Structural Geology	3
Geol. 184. Mineralogy	4

*Included in the program of General Studies.
NOTE: A student who wishes to qualify for a specialization in chemistry, physics or biological sciences may omit elements of geology and astronomy, but will be required to complete a second specialization.

Courses of Instruction

C&I 7 and Ed. Psych. 105 are prerequisite to all other courses in Education.

No courses in Education, except C&I 7, Ed. Psych. 105 and 106 are open to sophomores

Curriculum and Instruction

C&I

7. *Introduction to Education.* I, II, S. 2 hr. Current concepts underlying the educational system in the American society. This course gives the student experience in identifying the student's values, attitudes, and feelings with those of today's community and youth.

100. *Introduction to Elementary Education.* I, II, S. 3 hr. PR: C&I 7 and Ed. Psych. 105. Introduction to elementary education, including observation and participation in public schools. Principles of elementary education will be related to principles of learning in Ed. Psych. 106. Analysis of professional problems and procedures will be an integral part of the course. (To be taken concurrently with student teaching.)

104. *Principles of Teaching in Secondary Schools.* I, II, S. 4 hr. PR: Open only to those who qualify for the student teaching block.

120. *Reading and Language Arts in the Elementary School.* I, II, S. 3 hr. PR: C&I 7, Ed. Psych. 105, and enrollment in the elementary undergraduate program. Instructional practices in all phases of the language arts. (To be taken concurrently with Ed. Psych. 106, C&I 120 and 130.)

124. *English and Speech.* I, II, S. 2 hr. Methods and materials in the secondary school.

125. *Foreign Language.* I, II, S. 3 hr. Methods and materials in the secondary school. (Also listed as Foreign Language 221.)

126. *Library Science.* I, II. 2 hr. Methods and materials of high school teaching.

127. *Materials and Methods in Public-School Speech and Hearing Therapy.* I, II, S. 2-4 hr. PR: Consent. Includes experiences in Grades 1 to 12.

130. *Mathematics in the Elementary School.* I, II, S. 2 hr. PR: 6 hr. of mathematics, C&I 7 and Ed. Psych. 105, and enrollment in the elementary undergraduate program. Materials and methods with emphasis on use of problem situations and "discovery" procedures for development of mathematical ideas for the elementary school. (To be taken concurrently with Ed. Psych. 106, C&I 100 and 120.)

134. *Mathematics.* I, II, S. 2 hr. Methods and materials in the secondary school.

140. *Science in the Elementary School.* I, II, S. 2 hr. PR: C&I 100 and enrollment in the elementary undergraduate program. Study of modern practices in teaching science. (To be taken concurrently with C&I 150 and 187.)

144. *Science.* I, II, S. 2 hr. Methods and materials in the secondary school.

150. *Social Studies in the Elementary School.* I, II, S. 2 hr. PR: C&I 100 and enrollment in the elementary undergraduate program. Study of modern practices in the teaching of social studies. Principles and techniques underlying the community-oriented social processes, foreign culture and geography, and history. (To be taken concurrently with C&I 140 and 187.)

154. *Social Studies.* I, II, S. 2 hr. Methods and materials in the secondary school.

160. *Vocational Agriculture.* I, II. 3 hr. Methods and materials of high school teaching. (Also listed as Agr. Ed. 160.)

165. *Art Education in the Elementary School.* 3 hr. (Also listed as Art 165.)

166. *Art Education in the Secondary School.* 3 hr. (Also listed as Art 166.)

167. *Materials and Methods in Elementary-School Music.* I, II. 2 hr. (Also listed as Music 151.)

168. *Music.* I, II, S. 3 hr. Methods and materials in the secondary school. (Also listed as Music 152.)

174. *Physical Education.* I, II. 3 hr. Methods of teaching physical education. (Also listed as P.E. 130.)

175. *Home Economics.* I, II. 2 hr. Methods and materials of high school teaching.

187. *Student Teaching in the Elementary School.* I, II. 4-8 hr. PR: Ed. Psych. 105 and 106, and C&I 7. Open only to those seniors enrolled in the elementary education undergraduate program and who meet requirements:

1. Have a minimum grade-point average of 2.25 overall and a minimum grade-point average of 2.0 in: a. the subject specialization, three-fourths of which must be completed; b. education courses.
2. An applicant for student teaching must submit positive evidence that he or she meets requirements of physical condition and emotional stability necessary for the performance of the duties of a teacher.
3. C&I 100 must be taken concurrently with student teaching.
4. Admission is by application made prior to February 1 or the preceding year to the Director of Student Teaching.
5. Additional courses may not be taken with the student teaching block.
6. Student teaching will be done in selected centers throughout the state. Therefore, *students should be prepared to live off campus if so assigned.*

   NOTE: Students must avoid employment, social commitments, or housing contracts which would interfere with an off-campus assignment.

188. *Student Teaching.* I, II, S. 4-8 hr. PR: Ed. Psych. 105, 106, C&I 7 and Special Methods in subject area specialization. (Also listed as Agr. Ed. 188.) Open only to seniors and graduate students, regularly enrolled in the University, who meet the following requirements:

1. Completion of 75 percent of the hours required in each of two teaching fields, or one comprehensive field, with a minimum grade-point average of 2.0 (C) on *all* work taken in the teaching fields and in Education and a minimum overall grade-point average of 2.25.
2. An applicant for student teaching must submit positive evidence that he (or she) meets the requirements of physical condition and emotional stability necessary for the performance of the duties of a teacher. Such evidence must come from the University Health Service on a form used by the Division of Education.
3. This course must be taken concurrently with C&I 104.
4. Admission is by application made by February 1 of the preceding year to the Director of Student Teaching.
5. The student is responsible for maintaining knowledge of his eligibility. The student should check regularly each semester with the adviser for relevant information.
6. Students with no teaching experience are expected to take this course during the academic year.
7. Additional courses may not be taken with the student teaching block.

8. Student teaching will be done in centers throughout the state, *so students should be prepared to live off campus if so assigned.*

NOTE: Students must avoid employment, social commitments, or housing contracts which would interfere with an off-campus assignment.

205. *The Junior High School.* I, II. 2 hr. PR: Consent. Developing philosophy, program, and practices of the junior high school.

210. *Early Childhood Education.* SII. 3 hr. PR: CDFR 141, 142, C&I 100. Role early childhood education plays in development of child. Scope, content, and nature of programs for young children, as well as developing knowledge, skills, and attitudes necessary for working in such programs. Students observe and participate in early childhood programs and engage in research at this level.

211. *Early Childhood Education.* SII, 3 hr. PR: CDFR 142, 144, C&I 210. Continuation of C&I 210.

237. *Mathematics in the Junior High School and Middle School.* SII. 3 hr. PR: 6 hr. of college mathematics or consent. Teaching mathematics in junior high school or middle school; application of mathematics content to teaching; instructional techniques and materials.

267. *The Music Education Program.* S. 3 hr. PR: Consent. Organization and administration of the complete music education program for grades 1-12.

278. *Vocational Home Economics in Secondary Schools.* I. 3 hr. PR: Ed. Psych. 106, 25 hr. in family resources.

279. *Organization Administration of Physical Education.* 3 hr. (Also listed as P.E. 192.)

280. *Special Problems and Workshops.* I, II, S. 2-4 hr. PR: 14 hr. in education. To take care of credits for special workshops and short intensive unit courses on methods, supervision, and other special topics. Maximum of 8 semester hours may be applied toward the Master's degree, of which no more than 6 semester hours will be in Extension.

287. *Student Teaching Clinical Experience in Elementary or Secondary Education.* I, II, S. 2-4 hr. PR: Consent. Advanced course in student teaching, stressing clinical procedures in classroom learning problems.

288. *Clinical Practices in Public-School Speech and Hearing Therapy.* I, II, S. 2-8 hr. PR: Consent. Includes experience in grades 1 to 12. This course meets the requirements of SPA 282 and 283.

Educational Psychology

Ed. Psych.

105. *Human Development and Learning.* I, II, S. 3 hr. Emphasizes competencies in applying principles of learning and measurement in classroom instruction.

106. *Human Development and Learning.* I, II, S. 3 hr. PR: Ed. Psych. 105. Emphasis on development, standardized measurement, and classroom management.

231. *Sampling Methods.* I. 3 hr. PR: An introductory course in statistics. Methods of sampling from finite and infinite populations, choice of sampling unit, sample survey design, estimation of confidence limits and optimum sample size, and single and multi-stage sampling procedures. (Equiv. to Stat. 231.)

260. *Audio-Visual Resources for Instruction.* I, II, S. 3 hr. Survey of many types of materials available for teaching. Multisensory techniques, sources of materials, and practical classroom utilization. Laboratory arranged.

Health Education

Health Ed.

2. *Personal and Community Health.* I, II. 2 hr. Phases of healthful living. Emphasis on aspects of personal health.

101. *Elementary School Health Program.* I, II, S. 2 hr. PR: Ed. Psych. 105. The organization, educational aspects and personnel relationships involved in school health services, healthful school living, and health education. Required for teacher certification.

102. *Secondary School Health Program.* I, II, S. 2 hr. PR: Ed. Psych. 105. The organization, educational aspects and personnel relationships involved in school health services, healthful school living, and health education. Required for teacher certification.

Industrial Arts

No students are being accepted in the undergraduate Industrial Arts program. An extensive curriculum development project has been undertaken to establish a more modern and relevant curriculum model of teacher education in Industrial Arts.

Division of Family Resources

(formerly HOME ECONOMICS)

The Division of Family Resources provides a program for persons interested in obtaining undergraduate professional preparation in the broad field of home economics. The courses provide opportunity to study the environment of man, particularly his food, clothing and shelter, and the relationship of man to the environment. The focus is on human interaction and its consequences within the framework of the soical institution of the family.

Students enroll who are interested in numerous career opportunities in any of these areas:

- child development, nursery education, early childhood education, family life education, child welfare, family service occupation, and other community service fields.
- management and effective use of family financial and human resources.
- design and use of dwellings, interior design, and design and use of products, furnishings and equipment for the home.
- the textile and fiber industry, fashion, and fashion merchandising.
- food production, processing, and institutional food practices.
- human nutrition, nutrition education, and dietetics.
- journalism, particularly in the areas of food, fashion, and home service.
- teaching in elementary, junior high school, or secondary school programs in family life education, foods and nutrition, clothing and textiles, and consumer education.
- large industrial organizations whose major products are food, household equipment, or educational information and service directed toward the consumer.

The division provides not only for lectures but also for a variety of kinds of laboratory experiences and selected field work in different settings.

The need to educate competent and informed citizens and family members has never been more urgent. The division regularly attracts a large number of students from various departments in the University who enroll in courses to increase the scope of their knowledge in family relations and child development, foods and nutrition, textiles and clothing, housing and design, and family economics and management. Home economics has the longest tradition of any field for interest in the education of competent and informed consumers and family members.

Requirements for the Degree

Students have the choice of seven options toward a degree in home economics: social science emphasis, interior design emphasis, textiles and clothing emphasis, journalism emphasis, dietetics emphasis, home economics education, or general emphasis. The Bachelor of Science degree is granted with a minimum total of 128 hours, including a minimum of 58 upper-division hours.

Where written consent is required for courses offered by the Division of Family Resources it may be given only by the instructor or the Division Chairperson.

Minimum hours in Family Resources	36
Total hours in other areas	80
Electives	12
Grand Total	128

Required Courses

I. University Core Curriculum	*Hr.*
English Composition	6
Physical Education	2
Core Groups A, B, and C	36
Total	44

II. Family Resources Professional Core	
1. Child Development and Family Relations 144	3
2. Textiles and Clothing 22 *or* 121	3
3. Nutrition 71 *or* 175	3
4. Home Mgt. and Family Econ. 161 *or* 165	3
5. Housing and Design 31	3
Total	15

III. Options	
a. Social Science Emphasis	
1. Early Childhood	
(a) Restricted electives in Family Resources	14
(b) Electives in Family Resources	7-19
(c) General requirements	17
(d) Restricted general electives	10
(e) General electives	9-21
Total	69

2. Social Science
   (a) Restricted electives in Family Resources 14
   (b) Electives in Family Resources 7-19
   (c) Restricted general electives 15
   (d) General electives 21-23

   Total 69

3. Social Work
   (a) Restricted electives in Family Resources 14
   (b) Electives in Family Resources 7-19
   (c) Required Social Work courses 18
   (d) Restricted electives in Social Science 9
   (e) Speech Communication 3
   (f) General electives 6-18

   Total 69

b. Interior Design Emphasis
   1. Additional required courses in Art, Marketing, Business, Journalism, and Speech Communication 30
   2. Additional required courses in Housing and Design and Textiles and Clothing 33
   3. Restricted electives 6

   Total 69

c. Textiles and Clothing Emphasis
   1. Required courses in Family Resources 18
   2. Restricted electives in Family Resources 3-15
   3. Required general courses 15
   4. Restricted general electives 12
   5. General electives 9-21

   Total 69

d. Journalism Emphasis
   1. Restricted electives in Family Resources 15
   2. Electives in Family Resources 6-18
   3. Required Journalism courses 23
   4. Psychology or Political Science 6
   5. General electives 7-19

   Total 69

e. Dietetics Emphasis
   1. Required and recommended courses in Foods and Institution Administration and Nutrition 21-31
   2. Required and recommended courses in Physical Sciences 15-20
   3. Required and recommended general courses 12-18

4. Electives 0-21

Total 69

f. Home Economics Education Education Emphasis (Teacher Certification)

Students wishing a vocational teaching certificate and degree must take specified courses in the Core Curriculum and at least 8 hours in each of the five subject-matter areas in the Division. (See Programs for Secondary School Teachers under Education.)

g. General Emphasis

1. Restricted electives in Family Resources 21
2. Electives in Family Resources 0-12
3. Speech Communication 3
4. Journalism 3
5. Psychology 3
6. Sociology 3
7. General electives 24-36

Total 69

Home Economics Education

H.E.Ed.

175. *Methods of Teaching Home Economics.* I, II. 3 hr. To be taken the semester or year before student teaching. Planning, implementing, and evaluating teaching-learning experiences in a supportive learning environment.

278. *Vocational Home Economics.* 3 hr. PR: Senior standing or consent. Develops an understanding of federal vocational legislation to enable an individual develop program proposals and implement programs in areas of vocational education.

Textiles and Clothing

TC

22. *Principles of Clothing Construction.* I, II. 3 hr. Basic principles of clothing construction including pattern alteration and fitting. (Lab fee $5.00.)

27. *Textiles for Consumers.* I, II. 3 hr. Traditional background information and new developments in textiles. Special emphasis on development of raw materials into finished consumers' goods.

121. *Clothing for the Family.* I, II. 3 hr. Clothing in relation to social, psychological, and economic factors, including a study of the clothing industry, trends, and cultural significance. Field trip included.

123. *Costume Design.* II. 3 hr. PR: TC 22, 27. Figure and fashion drawing. Designing for individuals of various types and ages. Some history of costume included.

224. *Flat Pattern Design.* I, II. 3 hr. PR: TC 22, 27, 123 or consent. Opportunity for creative expression and for understanding of pattern design through flat pattern. Costumes designed and constructed by the student. (Lab fee $5.00.)

225. *Tailoring.* I, II. 3 hr. PR: TC 22, 27, 224. Tailoring suits and coats. Emphasis on professional techniques, advanced fitting, and construction of garments. (Lab fee $5.00.)

227. *Advanced Textiles.* I. 3 hr. PR: TC 27. Comparative characteristics of all textile fibers. Physical and chemical properties with reference to fiber morphology and/or manufacturing processes. Textile fiber products legislation. Physical and chemical laboratory experience.

Housing and Design

HD

31. *Introduction to Design.* I, II. 3 hr. Use of design elements and application of design principles to stimulate imagination and creative ability.

32. *Interior Design Graphics.* I, II. 3 hr. Various presentation media and techniques used to provide communication skills such as drafting, rendering, perspective drawing, and layout organization for professional graphic presentation.

33. *Housing Design.* I, II. 3 hr. PR: HD 31 or consent. Housing and home planning. Selection, arrangement, and use of interior and exterior space for activities carried on, in, and around the home. (Lab fee $5.00.)

34. *Interior Design Graphics II.* I. 3 hr. PR: HD 32. Continuation of HD 32.

133. *Interior Design I.* I, II. 3 hr. PR: HD 33. Aesthetic and practical aspects of coordinating the furnishings, background, accessories, lighting, and space of a house for family living. (Lab fee $5.00.)

233. *Decorative Arts I.* I. 3 hr. PR: 9 hr. HD courses. The decorative arts — antiquity to American periods.

234. *Decorative Arts II.* II. 3 hr. PR: HD 233. The decorative arts — American periods to present.

Child Development; Family Relations

CDFR

141. *Child Development I.* I and II. 3 hr. PR: Psych. 1, or Educ. Psych. 105, or consent. Various theories of human development: emotional, social, and cognitive. Contemporary and traditional theories. Laboratory experience of observing in pre-primary centers.

142. *Child Development II.* I, II. 3 hr. PR: Psych. 1 or Educ. Psych. 105 or consent. Principles of development during childhood including physical, psychological, and social factors affecting behavior. Observation and participation in the University Nursery School.

144. *Introduction to Marriage and the Family.* I, II. 3 hr. Relevant historical influences, mate selection, changing marriage legislation, the interplay of social roles in family relations, and problems of adjustment arising out of the demands of the contemporary social setting.

145. *Infant Development.* I, II. 3 hr. Developmental characteristics and issues during the prenatal period and the first eighteen months with implications for guidance and care.

244. *Family and Individual in Community.* I, S. 3 hr. PR: One course in the family, or sociology, or consent. Social psychological analysis of the individual in the family and in other social systems. Study of role relationships, community processes, and attitudes and values as they affect behavior of individual.

245. *Family Development.* II, S. 3 hr. PR: CDFR 144 or consent. Family development in cross-cultural and historical perspectives. The contemporary family with special attention to social class differences and use of life cycle and developmental task concepts as analytic tools.

246. *Adolescent Development.* II. 3 hr. The adolescent in contemporary American culture, including normative physical, social, and personality development; and relationships within various typical social settings (e.g., family, school, community, peer group).

284. *Special Topics in Child Development.* I, S. 1-4 hr. per sem. PR: Written consent.

288. *Special Topics in Family Relations.* II, S. 1-4 hr. per sem. PR: Written consent.

Foods; Institution Administration

FIA

55. *Food Principles and Practices.* I, II. 3 hr. PR: 8 hr. of a laboratory science. Basic principles of food selection, care and preparation. Emphasis on chemical and physical properties of foods and reactions which occur during processing. (Lab fee $10.00.)

151. *Meal Management.* I, II. 3 hr. PR: FIA 55 or consent. Management of time, energy, money, and nutrients in planning and preparing meals within the family setting. (Lab fee $15.00.)

153. *Institutional Food Production Systems Management.* II. 3 hr. PR: FIA 55, 151. Preparation of food in large quantities. Use of standardized formulae, calculation of costs, and use of institution equipment. Field trip included.

154. *Institution Food Procurement.* I. 3 hr. PR: FIA 153. Producing areas, distribution of food products, specifications, storage, and food practices in quantity buying. Observation in local wholesale markets, warehouses, and storage units. Tour of market facilities in Pittsburgh area required.

158. *Institution Organization and Management.* II. 3 hr. PR: FIA 153. Organization and management of food service. Field trip included.

255. *Experimental Foods.* II. 3 hr. PR: FIA 55, Chem. 131, or consent. Factors involved in food processing under various conditions. (Lab fee $10.00.)

258. *Laboratory Practice in Institution Management.* I, II. 3 hr. PR: FIA 158 and consent. Experience under supervision in planning, preparing, and serving food in an institution. Selection of place and type of experience to be determined by needs of students.

Home Management; Family Economics

HMFE

160. *Communication of Consumer Information.* I, II. 2 hr. PR: Minimum of 3 hr. in each of four areas of home economics or consent. Communicating ideas and information relative to goods and services available to the consumer. Emphasis on demonstration techniques. (Lab fee $5.00.)

161. *Family Economics.* I, II. 3 hr. Management of family's money resources. Consideration of economic problems, planned spending and saving, and the consumer's role.

165. *Home Management: Principles and Application.* I, II. 3 hr. PR: Upper-division standing. Study and application of management in a variety of situations faced by the family with opportunity to integrate knowledge from other courses. (Lab fee $5.00.)

166. *Home Management: Residence Laboratory.* I, II. 1-3 hr. PR: HMFE 165. Residence laboratory in home management principles and practices.

167. *Household Equipment.* I, II. 3 hr. Selection, arrangement, use and care of equipment for various situations and income levels. Lecture, laboratory, and discussion. (Lab fee $5.00.)

261. *Consumer Economics.* II. 3 hr. PR: Econ. 51 or HMFE 161, or consent. To help understand the consumer's role in our economy. Study of research methods and techniques used to identify, understand, and solve consumer problems.

Nutrition

NTR

71. *Introduction to Human Nutrition.* I, II. 3 hr. Nutrient structure, metabolism, integrated function and their importance to human well being during all stages of the life cycle. Current concerns and those of special interest to college students in meeting nutrient needs.

175. *Food and People.* I. 3 hr. The total significance of food to man and the ecology of food-behavior seen through the historical, cultural, economic, and physiological perspectives.

271. *Human Nutrition.* I. 3 hr. PR: NTR 71, biochemistry, physiology. Role of food nutrients in the physiological and biochemical processes of the body; nutritional needs of healthy individuals under ordinary conditions and in periods of physiologic stress.

273. *Community Nutrition.* II. 3 hr. PR: Consent. Nutritional health of individuals and groups, nutritional status assessment, dietary counseling, as well as the role played by agencies, organizations, and professional groups interested in nutrition.

274. *Diet Therapy.* II. 3 hr. PR: NTR 271, Biol. 266. Adaptations of normal diet for diseases whose prevention or treatment is largely influenced by diet.

Family Resources — Seminars

FR

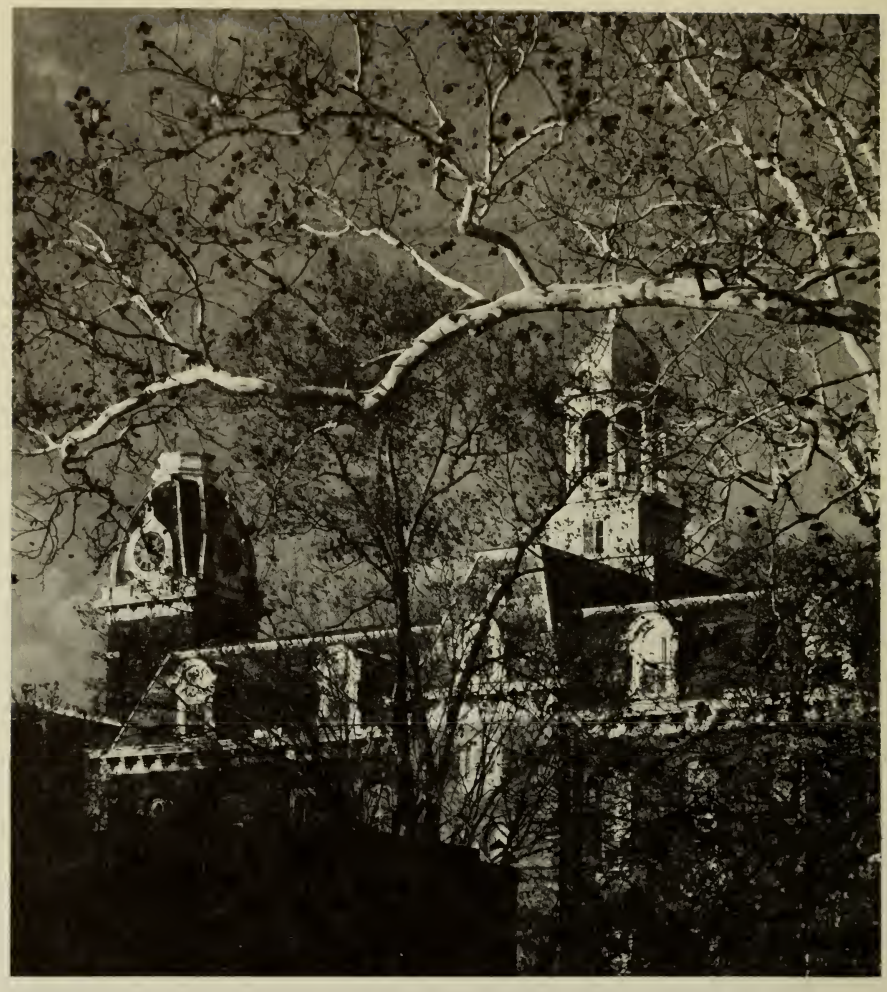
282. *Seminar in Clothing or Textiles.* I, II, S. 1-4 hr. per sem., max., 9 hr. PR: Written consent. Significant contemporary issues in clothing or textiles.

283. *Seminar in Housing and Design.* I, II, S. 1-4 hr. per sem., max., 9 hr. PR: Written consent and 12 hr. HD courses. Significant contemporary issues in housing or design.

285. *Seminar in Food and/or Institution Administration.* I, II, S. 1-4 hr. per sem., max., 9 hr. PR: Written consent. Significant contemporary issues in foods and/or institution administration.

286. *Seminar in Home Management or Family Economics.* I, II, S. 1-4 hr. per sem., max., 9 hr. PR: Written consent. Significant contemporary issues in home management or family economics.

287. *Seminar in Nutrition.* I, II, S. 1-4 hr. per sem., max., 9 hr. PR: Written consent. Significant contemporary issues in nutrition.



School of Journalism

The function of the School of Journalism, one of the six oldest in the United States (established in 1939), is to offer appropriate education to students who will become responsible communicators.

Many of the more than 1,200 graduates of the School of Journalism are applying the broad education and training they received in a variety of ways. They are covering important news events throughout the world such as the seething unrest of the urban ghetto for *Time*. They are managing huge accounts in advertising agencies like J. Walter Thompson and Carl Byoir and Associates in New York. They are directing the public relations programs of industrial giants such as Fairchild Camera. And they are newspaper reporters, broadcasters, university professors, businessmen, army officers, school principals, and housewives. Most are concerned and informed citizens — the product of a liberal arts background as well as an intense professional preparation.

The study of journalism — once limited to vocational training of newspaper reporters — has become much more. It is now aimed at the gamut of ways in which man communicates with his fellowman, with emphasis on ethics and responsibility in the broad study of mass communication and society. Such an education must be first the study of literature, economics, political science, psychology, sociology and anthropology, the natural sciences, and history, and the huge range of subjects of social concern. It also must be the study of the ways of communicating those ideas most effectively.

A journalism education involves more than learning how to write and edit news stories or broadcast documentaries or to prepare creative advertisements. It involves the study of substantive issues that will need to be communicated in the next fifty years as well as those which have already occurred.

When a student grasps the fundamentals of the liberal arts tradition, he must go on to acquire more than the ability to communicate. He must acquire ethical awareness because his work will have impact far beyond that of most occupations, and it should require standards of integrity and fairness equal to the increasingly complex problems of our time. A successful public relations practitioner or advertising executive must know where ethical advocacy of a product ends and hucksterism begins. The photographer-journalist and the editor must know where the presentation of fact ends and fabrication begins. It is in this realm, as well as that of substantive coursework, that a faculty of high quality plays a major role.

When you enroll in the School of Journalism, you are guided by a faculty of twelve full-time professors and three part-time professors who represent more than 200 years of cumulative journalistic experience. It is a faculty which represents the diversity of the school itself. The backgrounds and education of the teaching staff include professional experience with major magazines, newspapers, the wire services, radio and television, public relations firms, and advertising agencies.

The School of Journalism has arranged an internship program for news-editorial students with the *Morgantown Dominion-Post*. During a semester, students enrolled in reporting and editing classes write and edit news stories as part of their class work and receive credit for this. Other students have been named to Sears Congressional Fellowships in the nation's capital for one semester. In addition, the School maintains a working relationship with the *Daily Athenaeum*, the award-winning student newspaper at WVU. Students enrolled in news-

editorial classes may elect to work on the *Daily Athenaeum* under supervision of a professor as one segment of their course work. Others serve as reporters and editors for the paper as an extracurricular activity.

Advanced students in photo-journalism may receive practical experience as photographers for the *Daily Athenaeum*, as local stringers for Associated Press, and as part-time photographers for the WVU Office of Publications.

Advertising students find opportunities for practical experience by selling advertisements and servicing accounts for the *Daily Athenaeum* and other campus publications, as well as by handling the paper's other business matters.

Students directing their studies toward production have an opportunity to become involved in both letterpress and offset projects in typography and production laboratories. Those wishing to get involved in newspaper production have ample opportunity to become members of the *Daily Athenaeum* production staff, learning how to run the latest cold-type production equipment, as well as the intricacies of newspaper paste-up.

Public relations students generate and execute projects aimed at identifying and solving communications bottlenecks between local and statewide organizations and their publics.

Because students write, edit, sell ads, and even do the typesetting and page paste-up on the *Daily Athenaeum*, any facet of journalistic life can be experienced if a student so desires.

Broadcast news students also have a number of opportunities to gain professional experience, including the preparation of newscasts for local radio stations and special public affairs shows for the local cablevision channel. Some students work part-time on the University's educational television station (WWVU-TV), which involves mastering principles of documentary production and basic film editing. Students in radio courses are responsible for gathering and writing news for news programs.

The School of Journalism also operates a summer program that places superior students in jobs with major newspapers, magazines, radio stations, television stations, and industries for about ten weeks.

Faculty

Guy H. Stewart, Ph.D. (U. Ill.), *Dean of the School of Journalism and Professor of Journalism.*
Paul A. Atkins, M.A. (U. Va.), *Professor of Journalism.*
Donovan H. Bond, M.A. (WVU), *Professor of Journalism.*
Charles F. Cremer, Ph.D. (U. Iowa), *Associate Professor of Journalism.*
Harry W. Elwood, M.S. (Northwestern U.), *Assistant Professor of Journalism.*
Harry W. Ernst, M.S.J. (Northwestern U.), *Assistant Professor of Journalism.*
Dennis R. Godfrey, M.A. (WVU), *Adjunct Assistant Professor of Journalism.*
Richard L. Hopkins, M.S.J. (WVU), *Associate Professor of Journalism (on leave).*
Frank M. Kearns, B.A. (WVU), *Benedum Professor of Journalism.*
Hunter P. McCartney, Ph.D. (U. Penn.), *Professor of Journalism.*
Kenneth G. Mangun, M.S. (U. Ill.), *Assistant Professor of Journalism.*
Robert M. Ours, M.A. (U. Va.), *Assistant Professor of Journalism.*
Edward C. Smith, Ph.D. (U. Iowa), *Associate Professor of Journalism.*
Harley E. Straus, M.A. (U. Ore.), *Assistant Professor of Journalism.*
William R. Summers, Jr., M.A. (U. Mo.), *Professor of Journalism.*
C. Gregory Van Camp, M.S.J. (WVU), *Assistant Professor of Journalism.*
David A. Wesson, B.A. (Syracuse U.), *Assistant Professor of Journalism.*
Paul G. Yeazell, M.A. (U. Ariz.), *Assistant Professor of Journalism.*

Standing Committees

*Academic Standards:** P. A. Atkins *(Chairperson);* F. M. Kearns, W. R. Summers, Jr.; and Dean Stewart, ex officio.

*Scholarships:** H. W. Elwood *(Chairperson);* D. A. Wesson; and Dean Stewart, ex officio.

*Graduate Studies:** E. C. Smith *(Chairperson);* P. A. Atkins, C. F. Cremer, K. G. Mangun, H. P. McCartney, H. E. Straus; and Dean Stewart, ex officio.

Library Acquisitions: C. F. Cremer *(Chairperson);* H. W. Elwood, E. C. Smith; and Dean Stewart, ex officio.

Executive: Dean Stewart *(Chairperson);* P. A. Atkins, H. P. McCartney, and W. R. Summers, Jr.

Accreditation

The School of Journalism is accredited by the American Council on Education for Journalism (ACEJ) for the advertising and news-editorial sequences. ACEJ approval is held by sixty colleges and universities in the United States.

The quality of the School's program also has been recognized by memberships in the American Association of Schools and Departments of Journalism and the American Society of Journalism School Administrators.

Professional Relations

A close and continuing relationship is maintained with the West Virginia mass media through the West Virginia Press Association, the West Virginia Broadcasters Association, and an adjunct to the Press Association — the West Virginia Publications and Public Relations Section. These groups have provided scholarships and financial support for Journalism Week.

In turn, the School of Journalism provides services to the professionals. Regional advertising seminars have been conducted for newspaper publishers and retail merchants, and workshops on newswriting have been conducted for stringer-correspondents of weekly newspapers. The School also has provided science writing symposia and seminars on Appalachia, future of transportation, and interpretive vs. advocacy reporting for newsmen, and it has worked with the Publications and Public Relations Section of the Press Association in establishing seminars. The School has assisted journalism teachers by holding summer workshops.

Typewriting

Before or soon after entering WVU, a student planning to major in journalism should learn the touch system of typing. From the beginning, all students in writing courses are expected to submit copy in neat, typewritten form.

Admission

To be admitted to the School of Journalism as a journalism major, a student must meet these requirements:

1. Must have completed 58 hours with an overall grade-point average of 2.0.
2. Must have a 2.5 overall grade-point average if the student already has completed 75 hours.

*These committees include a student representative.

3. Must be approved by a faculty-student interviewing and counseling committee.

4. Must submit a typed statement to the chairperson of the interviewing committee explaining why the student wants to emphasize a specific area of journalism.

5. Must agree to complete at least 45 hours in the School of Journalism.

6. Must complete Journalism 18, or equivalent, with at least a C grade, before admission to the School.

Complete information concerning WVU admission, registration, fees and expenses, regulations, etc. may be obtained in Part 2 of this *Catalog.*

Proficiency in English

Competence in writing is emphasized. A student who proposes to major in journalism must achieve at least a 2.0 average or higher in English 1 and 2. In addition, students who plan to enroll in Journalism 18 must take the Journalism Language Diagnostic Examination. This examination should be taken the semester before enrollment in Journalism 18. It will be administered in the afternoon or evening of the first day of classes in each semester. Students must pass the examination to be allowed to register for or continue in Journalism 18.

Journalism Organizations

Students find that not all of their learning comes from the classroom or an assignment. Much learning comes instead from the challenging exchange and intellectual stimulation provided by fellow students.

Several organizations affiliated with the School of Journalism provide the opportunity for honor and recognition, as well as for fellowship and education. They are:

ADS/AAF, professional advertising fraternity.

Kappa Tau Alpha, national scholastic honorary for students with exceptional academic records in journalism.

Public Relations Student Society of America, national public relations professional organization.

Sigma Delta Chi, professional journalistic society for men and women.

Job Placement

The School of Journalism assists its graduates in finding desirable positions. It acts as a placement clearinghouse for current and past graduates.

Representatives of newspapers, magazines, public relations, broadcasting, and advertising often visit the campus to interview seniors, and they frequently request the School of Journalism to provide applicants for their respective openings.

Bachelor of Science in Journalism

A candidate who has satisfied all general requirements of the University and has met the requirements of the School of Journalism will be recommended for the degree of Bachelor of Science in Journalism or Bachelor of Science in Journalism Education, provided the combined number of credits acquired as a prejournalism student and as a regularly enrolled journalism major totals no fewer than 128. This total will not count non-translated courses from other

colleges, any course repeated more than one time (such as Music 102), or Mathematics 2.

In line with the national accreditation council and the school's philosophy on the ratio of professional journalism courses to courses in liberal arts, a degree candidate will take approximately one-fourth of the student's total hours in journalism. The minimum number of journalism hours will be 30 and the maximum number ordinarily will be 33.

No fewer than 40 semester credits shall be obtained in courses numbered between 100 and 400. A student must complete at least 45 hours of work after admission to the School of Journalism.

It is possible for a student to pursue another degree concurrently, but the candidate must work out the programs with the deans of the two colleges involved.

A student within 12 hours of graduation in the last semester may elect to take one or more courses for graduate credit. However, the student must consult with the adviser and petition the Graduate School.

The student, in the final semester, will be expected to provide for School of Journalism records a small head-and-shoulders photo and information about future employment preferences.

Scholastic Requirements

To be eligible for graduation, a student must earn a minimum cumulative average of 2.0; concurrently the journalism average and the average in the student's minor field must be at least 2.0.

No student will be recommended for the degree unless it has been shown to the satisfaction of the faculty that the student possesses abilities and qualities which give promise of doing adequate work in professional journalism.

Independent Study/Waivers

The journalism faculty encourages the taking of courses by examination and through independent study, when the student's background and the nature of the courses lend themselves to such arrangement. The method of examination can be appropriate when students have in some way other than by class attendance learned the course content. Independent study may be undertaken in some courses with the consent and supervision of the professor. In unusual cases, a student may receive the Dean's permission to waive a course.

Probation/Full-Time Load

A student on probation shall not take more than 15 hours of coursework in a semester, and the Committee on Academic Standards may require that the student not take more than 12 hours. Also, no student may enroll for more than 18 hours in a single semester without petitioning the Committee on Academic Standards.

Minor Field

To meet the requirements for a minor, a student must earn at least 15 semester credits in a subject other than journalism with no more than three hours in courses numbered under 100. Courses at 100 level or higher, even when they can be taken more than once, will be counted only one time (except Journ. 141). For students pursuing two minors simultaneously the requirements in each

area is at least 12 semester credits, of which no more than 3 credits can be numbered under 100. A student should consult the adviser about a minor.

Students from other major fields of study are permitted to minor in journalism.

Withdrawals from Class or University

All students enrolled in journalism courses may withdraw from a course through the first five weeks with a grade of W. After that date, a student may withdraw only after approval of the Committee on Academic Standards, and then the student will be awarded a grade of W or WU.

Journalism majors who withdraw from the University after the ninth week of a semester will be automatically suspended from the School of Journalism for a minimum of one semester (not including a summer term). If a late withdrawal results from illness, the student must present a written excuse from a physician at the time of withdrawal to avoid automatic suspension.

News/Editorial Curriculum

This curriculum is devoted to teaching fact-gathering, news and feature writing, and the various skills of editing.

The sequence stemmed from the first courses offered in journalism at WVU. Over the years it has expanded and been improved and today is fully accredited by the American Council on Education for Journalism (ACEJ), known throughout the country for its recognition of superior journalism programs. The School is recognized by membership in the American Society of Journalism School Administrators and the American Association of Schools and Departments of Journalism.

Most news-editorial graduates have found employment on newspapers, magazines, and other publications or with the international press associations. This, in part, is because they have received excellent preparation for such careers in print media by working on the staff of the *Daily Athenaeum* and other newspapers. Other graduates, however, have gone into broadcasting or public relations or hold writing and editing positions in the professions, scientific fields, business, industry, and government.

News-editorial students most frequently minor in political science, history or English. But it is becoming more common for them to select such areas as sociology and anthropology, psychology, speech communication, and drama.

First Year		Second Year	
Journalism 1	2	Journalism 19	3
Journalism 18	3	Journalism 120 (10)	3
English 1	3	History	6
English 2	3	Economics/Social Science****	6
Humanities	6	English elective	3
Science***	8	Science/Mathematics	6
Core A elective	3	Political Science	3
Political Science	3	Core A elective	3
Physical Education	2		

Third Year

Journalism 118	3
Journalism 128*	3
Minor (upper division)	6
Electives	18
English elective	3

Fourth Year

Journalism 227*	3
Journalism 228*	3
Journalism 230**	3
Journalism 299	3
Minor (upper division)	6
Electives	10-13
Journalism electives	3-8

Recommended journalism electives: Journ. 80, 108, 110, 111, 113, 130, 141, 182, 183, 220.
*Students may elect two of these courses: Journ. 128, 227, 228.
**Students may elect Journ. 220 as a substitute.
***Any combination of science or mathematics courses is acceptable towards the Core C requirement. This is true for all sequences.
****Either combination of the 50-level Economics courses or Social Science may be taken, but a student cannot mix three hours of Economics and three hours of Social Science. This is true for all sequences.

Advertising Curriculum

The curriculum is designed to prepare students for careers in the creation, sales, management, and production of advertising.

Journalism 10 and 113 are the basic courses in the sequence. Everything else in advertising instruction is founded on these courses.

Students develop a specialization in advertising in the junior and senior years. The specialization areas are: Advertising Copy (Journ. 251 and 286), Broadcast Advertising (Journ. 189 and 286), Advertising Sales and Media (Journ. 203 and 204), and Graphics and Production (Journ. 110 and 210).

The minor field is subject to the approval of the adviser. Some approved minors are marketing, economics, management, finance, business law, psychology, and speech communication. Fifteen hours, with no more than 3 hours in courses numbered under 100, are required for the minor. A second minor is optional.

Persons who are interested in practical application of advertising production problems should consider working part-time in the offset production plant of the *Daily Athenaeum* in addition to electing Journalism 210.

Students in advertising prepare for careers with advertising agencies, company advertising departments, retail advertising, promotion, and the media.

The advertising curriculum is accredited by ACEJ.

First Year

Journalism 1	2
Journalism 10	3
English 1	3
English 2	3
Science	8
Humanities	6
Political Science	3
Core A elective	3
Physical Education	2

Second Year

Journalism 18	3
Journalism 113	3
English elective	3
Core A elective	3
Economics/Social Science	6
History	6
Science	6
Political Science	3

Third Year

Journalism 114	2
Journalism 115	2
Journalism electives*	5-6
Minor Field	6
Electives	13
English elective	3

Fourth Year

Journalism 139	2
Journalism 299	3
Journalism electives*	5-6
Minor Field	6
Electives	13-15

*Advertising majors select one speciality area:

(Journ. 286, 251)	(Journ. 189, 286)
(Journ. 203, 204)	(Journ. 110, 210)

Broadcast Journalism Curriculum

This curriculum provides the student an opportunity to learn the theory and application of the art and science of news and public affairs reporting via the electronic media — radio, television, and cable.

Supported by a broad liberal arts background, the curriculum features an effective preparation in the philosophy, concepts, and skills of informational programming in professional broadcasting. Such preparation provides the student with an appreciation of radio, television, cable, and motion pictures as communicative and journalistic arts. Additionally, it challenges the student's ability to evaluate and criticize broadcast media capabilities and limitations, functions, performance, responsibilities, and influence in society.

Professional staff members of WVU's Office of Radio, Television, and Motion Pictures hold joint appointments and teach broadcast journalism courses. This office operates the University-owned educational television station, WWVU-TV.

Students seeking a career in the news and information area in broadcasting should pursue this curriculum. A double minor is required. One of these minors must be speech communication; political science is recommended for the second.

First Year

Journalism 1	2
Journalism 80	3
English 1	3
English 2	3
Physical Education	2
Science	8
Humanities	6
Political Science	3
Speech Com. 11 and 14	3

Second Year

Journalism 18	3
Journalism elective	3
English electives	6
History	6
Political Science	3
Science/Mathematics	6
Core A elective	3
Speech Com. elective	3

Third Year

Journalism 182	3
Journalism 183	3
Journalism 189	3
Speech Com. electives	6
Economics/Social Science	6
Political Science electives	6
Electives	3

Fourth Year

Journalism electives	6-7
Journalism 284	3
Journalism 299	3
Electives	18

Recommended journalism electives: Journ. 19, 111, 113, 120, 128, 227, 228, 286, 289.

Public Relations Curriculum

A relatively new profession within the sphere of communications, public relations (PR) offers practitioners challenging opportunities to explain organizations — industrial, educational, military, charitable — to their publics. The profession has had its major advance since World War II, and today more than 100,000 persons are practicing in the field. WVU graduates are finding ready acceptance of their services.

Public relations offers rewarding careers to both men and women. Several fields — transportation, entertainment, convention arrangements, and company newspapers — seem to prefer the feminine touch. Husband and wife PR teams are not uncommon, so the woman who wishes to follow a dual career — homemaker and part-time or full-time professional work — finds public relations a flexible activity to fit her uncertain schedule.

The PR curriculum is organized to provide the student a comprehensive familiarity with all aspects of communications — written, spoken, and image. The student learns to gather, interpret, and present information in the varied media of communications — newspapers, radio, TV, and specialized forms (brochures, reports, slides, speeches, etc.). The student learns principles of advertising, photography, typography and layout, PR programming, and organizational and management functions.

A public relations major is encouraged to select a minor that will provide a deeper understanding of personal and interpersonal relationships, e.g., political science, psychology, sociology and anthropology, or one that will enhance the projected area of practice, e.g. business and economics, education, science.

First Year

Journalism 1	2
Journalism 10	3
English 1	3
English 2	3
Physical Education	2
Humanities	6
Science	8
Core A elective	3
Political Science	3

Second Year

Journalism 18	3
Economics/Social Sciences	6
English	6
History	6
Minor subject	3
Science/Mathematics	6
Core A elective	3

Third Year

Journalism 111	3
Journalism 113	3
Journalism electives	2-3
Political Science	3
Speech Com. 11 and 12, 13 or 14	3
Minor subject	6
Electives	13

Fourth Year

Journalism 112	2
Journalism 221	3
Journalism 299	3
Journalism electives	5-6
Minor subject	6
Electives	12-14

Recommended journalism electives: Journ. 80, 110, 118, 120, 130, 131, 141, 182, 183, 189, 210, 220, 227, 230.

Journalism Education

The School of Journalism has been working for a number of years with journalism teachers and administrators in West Virginia schools to improve journalism instruction and school publications. An even greater effort has been mounted over the past decade by way of regional high school workshops, summer workshops for students and teachers on the WVU campus, and individual consultation with schools by members of the School of Journalism faculty.

One of the outgrowths of this cooperative effort has been a new certification program in journalism. The student who finishes the curriculum outlined here and receives the degree of Bachelor of Science in Journalism will qualify for a first-class professional certificate in West Virginia with teaching fields in Journalism and English (or other fields of student's choice), Grades 7-12.

While English is selected as the second field by most journalism majors, one may name social studies, speech communication, art, or another field. However, one must also add 9 hours of English and Speech Communication from the General Studies section of the certification program.

If a student elects journalism as a second field, he must take Journalism 1, 18, 19, 120, 125, and 227 for a total of 16 hours plus 5 hours of journalism electives.

A student must attain an overall grade-point average of 2.25 before being admitted to student teaching, and the grade-point average must be at least 2.0 in any field chosen for certification. Furthermore, the student must not plan to enroll for any courses outside of the teaching block in the semester during which the student plans to do student teaching; the student may have to teach in a community away from Morgantown.

First Year

Journalism 1	2
Journalism 10, 41, 113	3
English 1	3
English 2	3
Science	8
Art 30	3
Music 30	3
History 1	3
History 2	3
Physical Education	2

Second Year

Journalism 18	3
Journalism 19	3
Mathematics 21**	2
Mathematics 22	2
Health Education 102	2
Social Science 1***	3
Social Science 2	3
English 21 (121)*	3
English 22 (122)*	3
English 24*	3
English 25*	3
Curric. & Instrn. 7	1

Third Year

Journalism 125 2
Journalism electives 7-8
Educ. Psych. 105 3
Educ. Psych. 106 3
Curric. & Instrn. 280 3
English 111 3
English 150 3
English 131, 220, 235, 266, 283 3
English 161, 162, 255, 256, 261, 262 3
Speech Com. 11, 14, or Drama 50 3

Fourth Year

Journalism 120 3
Journalism 227 3
Journalism 299 3
Curric. & Instrn. 104 4
Curric. & Instrn. 188 6
Curric. & Instrn. 287 2
Journalism electives 5-8
English 132, 163, 164, 263, 264, 265, 267, 284, 365 3
English 125, 234, 236, 337, or Humanities 141, 142 3

Recommended journalism electives: Journ. 110, 111, 113, 118, 141, 220, 228, 230.
*These English requirements are different if a student chooses a second teaching field other than English.
**Mathematics 15 (4 hr.) may be substituted for Mathematics 21 and 22.
***Economics 51 (3 hr.), Political Science 2 (3 hr.), and Sociology 1 (3 hr.) may be substituted for Social Science 1 and 2.

Courses of Instruction

Journ.

1. *Introduction to Mass Communications.* I, II. 3 hr. Recommended for all University students. The mass communicator's role in developing political, social, and economic fabrics of a democratic society. Organization and function of newspapers, magazines, broadcast stations, and other principal media, including the role of advertising.

10. *Visual Communication.* I, II. 3 hr. Graphic arts as a communication medium. Discussion of photography and typography with emphasis on basic techniques and aesthetics.

18. *News Writing.* I, II, S. 3 hr. Essentials of fact-gathering; writing news and features; ethics and responsibilities of news reporting. Typing ability required. Separate lab sections offered for journalism majors and non-majors. Also, an honors section (AA) and lab (BB) available to students with previous newswriting experience. Two lec. and a 2-hr. lab-demonstration period.

19. *Copy Editing and Make-up.* I, II, S. 3 hr. PR; Journ. 18. Combination lecture-lab once a week for four hours, plus lab experience at a local newspaper. Copy editing, headline writing, handling of wire copy, and newspaper make-up.

41. *Journalism Problems.* I, II, S. 1-3 hr. For freshmen and sophomores. Intensive study, independently conducted, of a specialized area or problem in journalism; to be approved by the Dean.

80. *Introduction to Broadcasting.* I, II, S. 3 hr. Open to freshmen and sophomores. The industry and its role. Historical development of broadcasting, federal regulation, industry codes, broadcaster responsibilities, job opportunities. Broadcasting research, contemporary problems (including CATV). (Also listed as Speech Com. 80.)

108. *The Community Newspaper.* I. 2 hr. Open to all University students. Fundamental problems and techniques in operation and management of small community newspapers.

110. *Typography and Printing Processes.* I, II, S. 3 hr. Fundamentals of print production, including design and composition procedures for major printing processes, discussion and application of typographic aesthetics. Students must acquire tools for the course: cost about $5.00. One lec., 2-hr. lab.

111. *Public Relations Principles.* I, II, S. 3 hr. Open to all University students; required in the public relations curriculum. Introduces the student to communication between an organization and its publics. Definition and historical development, opportunities and challenges, techniques and management of public relations are included. Written assignments include typical public relations communications projects — the promotional pamphlet, executive speech, news release, and others.

112. *Industrial and Technical Journalism.* I, II. 2 hr. Relations between industry and its many publics, with emphasis on internal and external company publications as public relations media. Practice in planning and writing materials and in page make-up for industrial publications and trade journals.

113. *Principles of Advertising.* I, II, S. 3 hr. Open to all University students. Function of advertising in the American economic system for national and retail advertisers. Study of individual advertising and media, copy and layout problems, appeals, research production, schedules, federal and state laws affecting advertising, and ethics. Practical laboratory work in writing and layout of advertising. Two lec. One 2-hr. lab.

114. *Retail Advertising.* I, II. 2 hr. PR: Journ. 10 and 113, or consent. Planning, preparation of newspaper advertising campaign for a daily newspaper, including supplementary assignments in radio copy, direct mail, outdoor advertising, and sales promotion. Two hr. lecture.

115. *Advertising Copy and Layout.* II. 2 hr. PR: Journ. 10, 113, and 114, or consent. Copy platforms, print production and layout, mechanical specifications. Special assignments in direct mail and media research. Two hr. lecture.

118. *Reporting.* I, II, S. 3 hr. PR: A grade of C or higher in Journ. 18. Development of a student's ability to cover and write news stories. Students write features, breaking news, interpretive reports, personality profiles, and investigative stories. Students are expected to have their stories printed in the student newspaper, local downtown paper, or other media.

120. *Introduction to Photography.* I, II, S. 3 hr. Basic techniques of film developing and printing. Students required to purchase their own film, enlarging paper, and have a camera. Cameras may be rented from the WVU Book Store for $35.00 per semester; film and enlarging paper cost approximately $25.00 per semester.

125. *High School Journalism.* II, S. 2 hr. Only for B.S.J.E. candidates and students seeking Language Arts certification. Scholastic publications and techniques; suggested methods of instruction.

128. *Reporting of Public Affairs.* II. 3 hr. PR: Journ. 18 or consent. Reporting local, state, and federal government activities and other public affairs. Visits to public agencies and training in spot news and depth reporting in public affairs.

130. *Advanced Photography.* I. 3 hr. PR: Journ. 120 or equiv., or consent. Designed to equip students to serve all communication media (including magazines, newspapers, television) or photographic galleries. A high level of competence is assumed at the outset. Course requirements include a portfolio (general or around a specific theme) and an essay on the work of a recognized (contemporary or historical) photographer. Students must provide their own photographic equipment, film, paper, and pay $5.00-$10.00 for chemicals.

131. *Advertising Photography.* II. 3 hr. PR: Journ. 120 or consent and Journ. 113. Studio and outdoor photography layout and design.

139. *Seminar in Advertising Management Problems.* I, II. 2 hr. PR: Senior standing and major or minor in advertising. Trends in advertising, merchandising, and distribution problems. Individual projects in some phase of advertising or management.

141. *Advanced Journalism Problems.* I, II, S. 1-6 hr. For juniors and seniors. Intensive, independent study; to be approved by the Dean.

182. *Broadcast Journalism I.* I, II. 3 hr. PR: Journ. 18 or consent. Lecture-laboratory course oriented to radio news. Gathering, writing, editing, and presenting news for radio. Outside taping and studio taping, broadcasts; monitoring local and network newscasts. Emphasis on writing news scripts.

183. *Broadcast Journalism II.* I, II. 3 hr. PR: Journ. 182 or consent. Continuation of Journ. 182, with course content oriented to television news.

187. *Appreciation of the Motion Picture.* I, II. 3 hr. Viewing lab. Appreciation of the motion picture and the television film as art forms. Aesthetics involved in evaluating films. Various types of films: art film, documentary, entertainment, experimental, instructional, etc. Weekly viewing and evaluation sessions. (Also listed as Speech Com. 187.)

189. *Newsfilm in Television.* I, II. 3 hr. Planning, shooting, editing, and scripting of newsfilm for television newscasts.

203. *Media Management and Promotion.* I, II. 3 hr. PR: Journ. 113 and 115. Problems, functions, and responsibilities in communications media organization, operation, management, and promotion. Special emphasis on case study of media management and promotion in the Appalachian area.

204. *Advertising Markets and Media.* I, II, S. 3 hr. PR: Journ. 113. Advertising planning, buying, and scheduling by advertisers, media, and advertising agencies on national and local levels. Seminar discussions and assignments; special emphasis on problems related to Appalachian markets and media.

210. *Advertising Production.* II. 3 hr. PR: Journ. 110. Techniques and mechanics of producing print advertising. Art, typography, printing processes, layout, make-up, and scheduling. Student must acquire tools and supplies for lab work; cost: about $10.00.

220. *Writing for Magazines.* I, II. 3 hr. PR: Competence in English fundamentals: grammar, punctuation, syntax, spelling. For juniors, seniors, and graduate students. All work must be typed. Advanced seminar in writing and publishing magazine articles and in-depth newspaper articles. The student proposes worthwhile topics for specified publications. Emphasis on collecting information, high quality writing — with stress on fundamentals — and professional preparation of manuscript. Journalism majors must have completed Journ. 18.

221. *Public Relations Interning.* I, II. 3 hr. Open only to junior, senior, and graduate public relations majors. Student learns through on-the-job training and from reports of those who have on-the-job experience. Course structured along a public relations agency organization and operations.

227. *History of Journalism.* I, II, S. 3 hr. PR: Hist. 52, and 53 or consent. Open to all University students. Impact of American press on the nation; development of today's media from the beginnings in seventeenth century England and in the American colonies; great names in journalism; freedom of the press and its current implications.

228. *Law of the News Media.* II. 3 hr. For seniors and graduate students. The law as it affects the mass media. Considered are such areas as libel, public records, criminal pre-trial publicity, freedom of information, obscenity.

230. *Editorial and Critical Writing.* I. 3 hr. Open to all University students. The student will analyze and write editorials and commentaries; study typical editorial pages and the ethics governing editorial page content; become familiar with libel, privacy, contempt, and other problems — operating and political — as they arise.

251. *Direct Mail Advertising.* I. 3 hr. PR: Journ. 113 and 114 or consent. Mailing, marketing, and creation of direct mail letters, brochures, involvement pieces, and reply cards. Postal regulations, direct mail law, and printing procedures. Two lec., one lab.

284. *Public Affairs Programming.* I, II. 3 hr. PR: Journ. 183 and consent. Preparation and presentation of public issues via television. Methods of topic selection, research, organization of ideas and script development, alternate formats, ethical and legal constraints.

285. *Special Topics in Broadcast Journalism.* I, II. 1-6 hr. PR: Journ. 284. Directed independent investigation of selected topics in broadcast journalism. Repeatable up to 6 hr.

286. *Radio and Television Advertising.* I. 3 hr. PR: Journ. 113 and consent. Radio and television writing techniques. Media planning, buying; market analysis. Federal regulations affecting advertising.

289. *Documentary Motion Picture Production.* II. 3 hr. PR: Journ 189 and 281 or Speech Com. 184 or 280. In-depth development of the techniques and resources utilized in the production of a complete documentary motion picture. Films, processing, cinematography, editing, research, writing, music, narration. Lab oriented. It may be necessary for students to pay for camera rental and for their own film stock and film processing.

299. *Contemporary Media Issues and Ethics.* I, II. 3 hr. Required of all senior journalism majors. In-depth study of contemporary media issues such as right of access to media, morality in news and advertising, new FTC and FCC regulations, media responsibility to society, social responsibility of media professionals. Individual research papers on issues with ethical considerations.

302. *Seminar in Communications Theory.* I. 3 hr. PR: Social psychology or philosophy of science. For graduate students. Communications theory drawing heavily on social psychology and other behavioral theory. Philosophy of science. Theory as knowledge. Familiarization with communications theories. How to draw on published research findings and theory for understanding society. Student begins to learn how to apply theory to problems in the student's area of communications interest. Begin thesis.

312. *Seminar in Institutional Relations.* II. 3 hr. Problems of public information officers in educational institutions of higher learning and public service organizations; thorough study of the publics which these officers attempt to reach.

315. *Seminar in Journalism Education.* I, S. 1-3 hr. Journalism education problems. Each student will do an individual research project planned to provide for his professional development as a teacher of journalism. Emphasis on secondary school problems.

339. *Seminar in Advanced Advertising Management Problems.* II. 3 hr. Recently developed ideas and techniques in advertising, advertising research, and media management.

341. *Special Topics.* I, II, S. 1-6 hr.

343. *International Communications.* I. 3 hr. International news gathering and dissemination — including wire services, broadcast satellites, and political barriers — will be examined, particularly as these factors affect a free exchange of information within the world community. Efforts by the United Nations to encourage news exchange and to lower news barriers will be a major case examination.

344. *Seminar in the Foreign Press.* II. 3 hr. Studies in legal and communications problems of the international flow of news and opinion; international press codes; communications media of major countries.

School of Medicine

The curriculum for the degree of Doctor of Medicine (M.D.) is described fully in the *WVU Graduate Catalog.*

Program of Medical Technology

The Program of Medical Technology is under the administration of the School of Medicine. Students are admitted into the medical technology program leading to a bachelor of science degree after the completion of two years of premedical technology in an accredited college or university. The WVU medical technology program is approved by the Council on Medical Education of the American Medical Association. Graduates are eligible for certification by the Board of Registry of the American Society of Clinical Pathologists (ASCP).

The curriculum includes both the premedical technology program, which is offered in the College of Arts and Sciences of WVU, and the medical technology program, which is offered in the School of Medicine.

Courses of the first two years (premedical technology) may be taken in any institution of recognized standing that offers the courses required for admission into the medical technology program.

Since the course of study of the last two years is of a professional nature, students must be enrolled in the WVU School of Medicine for this entire period. The work of the junior year (the first year in the medical technology program) includes courses which introduce the student to the medical sciences. During the senior year (the second year in the medical technology program) the student receives both didactic instruction and practical experience in University Hospital laboratories.

The program's primary aim is to provide a strong undergraduate knowledge in medical technology which leads to a Bachelor of Science degree and which provides an educational background acceptable for graduate work in the medical sciences. The purposes are: (1) to provide a program in medical technology which meets the academic standards of the University: (2) to provide medical technologists for clinical, public health, and research laboratories; and (3) to provide an educational background which enables students to prepare for teaching and supervisory positions in medical technology.

A graduate program in medical technology is offered. (For information, see the *WVU Graduate Catalog.*) A program for ASCP registered medical technologists who desire to complete requirements for a Bachelor of Science degree also is available. (Further information may be obtained by contacting the Medical Technology office.)

Faculty

Vicente Anido, M.D. (Havana U.), *Professor and Chairperson of Clinical Pathology; Director, Clinical Laboratories; Coordinator of Medical Technology.*
Sue B. Chance, M.S. (SUNY), *Instructor in Medical Technology.*
Sandra R. Chapnick, B.S. (Ohio St. U.), *Instructor in Medical Technology.*
Nancie Ann Graham, B.S. (WVU), *Instructor in Medicine (Metabolism and Endocrinology) and Medical Technology.*
Marta J. Henderson, M.S. (WVU), *Assistant Professor of Medical Technology.*

Betholene F. Love, M.S. (U. Okla.), *Professor and Associate Coordinator of Medical Technology (Education).*
Dane W. Moore, Jr., M.S. (WVU), *Professor of Medical Technology.*
John Nevins, B.S. (WVU), *Instructor (part-time) in Medical Technology.*
Anne W. Sharpe, B.S. (WVU), *Assistant Professor of Medical Technology and Pathology.*
Robert M. Shoemaker, M.S. (WVU), *Instructor in Medical Technology.*
Judith A. Tanner, B.S. (Alderson-Broaddus C.), *Assistant Professor of Medical Technology.*
Paul H. Taylor, B.S. (WVU), *Assistant Professor of Medical Technology.*
Ida I. Yoder, M.S. (WVU), *Assistant Professor of Medical Technology.*

Admission to Medical Technology Program

Application for admission into the junior year (first year in the medical technology program) should be made before the beginning of the second semester of the sophomore year in college. Students at WVU are not transferred automatically from the pre-professional course (first two years) to the professional course (third and fourth years). Students are selectively admitted to the Program of Medical Technology for their final two years of work.

Application forms for admission to the professional course are obtained from the Office of the Assistant to the Dean of Admissions and Records, Medical Center. These forms should be completed and returned to that office no later than February 1, if the student wishes to enter the succeeding first semester classes.

Admission to the third year is on the recommendation of interviewing committees to the Medical Technology Faculty, Advisory and Admissions Committee, and the Dean. A personal interview with the Committee is required.

Admission Requirements*

(a). Admission requirements for the first year (premedical technology) are those for the College of Arts and Sciences.

(b). Admission to the third year (medical technology) is based upon two years of college work with a total of 64 hours as follows:

English. 6 hours. (Composition and rhetoric.)

Biological Science. 8 hours. (General biology or general zoology.)

Chemistry. 15-16 hours. (Inorganic chemistry, 8 hours; quantitative analysis, 3-4 hours; organic chemistry, 4 hours.) (Transfer students are required to have a complete course in organic chemistry to include aliphatic and aromatic compounds.)

Physics. 8 hours.

Physical Education. 2 hours. (University requiremets for students taking first two years in residence.)

Mathematics. 3 hours. (College algebra.)

Electives to complete the required hours and to meet WVU Core Curriculum requirements. Courses such as bacteriology, parasitology, and anatomy should not be taken until after the completion of the sophomore year. A foreign language is recommended for students who plan to do graduate work.

*Complete information concerning WVU admission, fees and costs, registration, regulations, etc. may be found in Part 2 of this *Catalog.*

Degree

The Bachelor of Science in Medical Technology degree is granted to those students who have completed the prescribed curriculum and who have been recommended for the degree by the faculty of the School of Medicine.

CURRICULUM PLAN
Premedical Technology

First Year

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15—Inorganic	4	Chem. 16—Inorganic	4
English 1—Comp. & Rhet.	3	English 2—Comp. & Rhet.	3
Elective*	3	Math. 3	3
Biol. 1—General	4	Biol. 2—General	4
Phys. Educ. 1	1	Phys. Educ. 2	1
Med. Tech. 1**	1	Med. Tech. 2**	1
	16		16

Second Year

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Chem. 131—Organic	4	Chem. 115—Quant.	3
Electives*	6	Electives*	9
Physics 1	4	Physics 2	4
Med. Tech 3**	3		
	17		16

*Electives are to be selected to meet University Core Curriculum requirements.
**Medical Technology 1, 2, and 3 are not required subjects. It is highly recommended that all students take these courses.

Medical Technology

Third Year
(Medical Technology I)

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Med. Tech. 100	4	Parasitol. 224	4
Biochem. 139	5	Microbiol. 220	5
Physiol. 141	4	Biochem. 239	4
Elective	3	Med. Tech. 101	4
	16		17

Total 33

Fourth Year
(Medical Technology II)

Students receive didactic and clinical instruction in the University Hospital laboratories after completion of the junior year. The course of study begins with the summer session and covers three academic semesters. Students may be required to be "on duty" at irregular hours due to the Professional nature of the collegiate program. Likewise, if the student has excessive absences during the senior year, the time loss must be made up at the end of the school year.

Students register for the following courses during the three semesters of study.

	Hr.
M. Tech. 200—Orientation	No Credit
M. Tech. 201—Clinical Microbiology	7
M. Tech. 202—Immunohematology and Blood Banking	7
M. Tech. 203—Instrumentation	2
M. Tech. 204—Clinical Chemistry	7
M. Tech. 205—Laboratory Management	2
M. Tech. 206—Clinical Microscopy	2
M. Tech. 207—Clinical Histopathology	2
M. Tech. 208—Clinical Hematology	7
M. Tech. 109—Clinical Serology	2
M. Tech. 210—Seminar I	2
M. Tech. 210—Seminar II	2
Total Credit Hours for Senior Year	42

Courses of Instruction in Medical Technology

Medical Technology

Med. Tech.

1. *Orientation to Medical Technology.* I. 1 hr. Principles and practices of medical technology and the role of the medical technologist as a member of the health team.

2. *Orientation to Medical Technology.* II. 1 hr. Continuation of the work of Med. Tech. I.

3. *Introduction to Clinical Pathology.* I. 3 hr. Introduces medical terms and illustrates the various aspects of patient care including laboratory diagnostic procedures the student will be doing the third and fourth years.

100. *Medical Technology.* I. 4 hr. The gross and microscopic structure of the human body.

101. *Clinical Laboratory Diagnostic Methods.* II. 4 hr. Procedures used in the clinical laboratories.

200. *Orientation.* S. No credit (For senior students.) Principles and practices of medical technology in relation to the hospital and clinics.

201. *Clinical Microbiology.* I, II, S. 7 hr. Lectures and laboratory practice in clinical bacteriology, mycology, and parasitology.

202. *Immunohematology and Blood Banking.* I, II, S. 7 hr. Lectures and laboratory practice in blood banking. Emphasis on procedures required for transfusions, preservation of blood, blood derivatives, and antibody studies.

203. *Instrumentation.* I, II, S. 2 hr. Basic physics and electronics as they apply to laboratory instruments.

204. *Clinical Chemistry.* I, II, S. 7 hr. Lectures and laboratory practice on procedures used in the clinical chemistry laboratory. Advanced instruction in specialized technics.

205. *Laboratory Management.* II. 2 hr. Laboratory organization, economics, ethics, and records.

206. *Clinical Microscopy.* I, II, S. 2 hr. Lectures and laboratory practice in urinalysis, gastric analysis, pregnancy tests, and other procedures.

207. *Clinical Histopathology.* I, II, S. 2 hr. Lectures and laboratory practice in preparation of human tissues and organs for gross and microscopic examination.

208. *Clinical Hematology.* I, II, S. 7 hr. Lectures and laboratory practice in clinical serology.

209. *Clinical Serology.* I, II, S. 2 hr. Lectures and laboratory practice in clinical serology.

210. *Seminar.* I, II. 1-4 hr. Each student is required to present at least one seminar on some phase of medical technology.

300. *Seminar.* I, II, S. 1 hr. Current research and topics in medical technology. A registration requirement for full-time graduate students.

497. *Individual Research Problems.* I, II, S. 1-15 hr. Opportunity for independent study and investigation of pertinent problems in medical technology.

Division of Physical Therapy

The Division of Physical Therapy, under the auspices of the School of Medicine, offers the final two years of a baccalaureate program leading to a degree in physical therapy.

The first two years of study may be completed in the College of Arts and Sciences of WVU, or any other institution which offers courses comparable to the admission requirements of the Division of Physical Therapy. To be eligible for a degree a student must complete the final two years of the curriculum at WVU.

Admission to the third year is based upon 62 or more credit hours of study which satisfies the University's Core Curriculum and the prerequisites, or their equivalent, of the Division of Physical Therapy. Registration in the first two years does not automatically assure the student a place in the junior class. Students will be accepted on a competitive basis and selections will be based on scholastic standing and on those personal characteristics which are desirable in physical therapists.

The student must satisfactorily complete a three-month period of clinical internship following the awarding of the baccalaureate degree. A Certificate of Proficiency in Physical Therapy then will be awarded which entitles the graduate to seek membership in the American Physical Therapy Association and to become eligible for state licensure for the practice of physical therapy. A physical therapist can practice professionally only after having passed the state board examination in the state where employment is desired.

Faculty

Marylou R. Barnes, M.A. (Madison C.), *Director and Associate Professor.*
Frances Adams, B.S. (WVU), Cert. P.T., *Clinical Instructor.*
Ray A. Boone, B.S. (Wash. U.), *Instructor.*
Sandy L. Burkhart, B.S. (E. Stroudsburg St. C.), Cert. P.T., *Assistant Professor.*
Anthony Carlo, B.S. (King's C.), Cert. P.T., *Clinical Instructor.*
Ellen Christopher, B.S. (Northwestern U.), Cert. P.T., *Clinical Instructor.*
Barbara A. Conway, B.S. (Med. C. Va.), *Clinical Instructor.*
Carolyn A. Crutchfield, M.S. (WVU), *Assistant Professor and Assistant Director.*
Hugh Galford, B.S. (Davis & Elkins C.), Cert. P.T.,*Clinical Instructor.*
Frances L. Golden, M.S. (Case West. Res. U.), *Assistant Professor.*
John Goshorn, B.S. (Penn. St. U.), Cert. P.T., *Clinical Instructor.*
Frances Gregory, B.S. (Kans. St. U.), Cert. P.T., *Clinical Instructor.*
Beverly Gryth, B.A. (Augsburg C.), Cert. P.T., *Clinical Instructor.*
Mary McKnight, B.A. (Columbia C., S.C.), *Clinical Instructor.*
Charles E. Meacci, M.S. (Boston U.), *Instructor.*
Carole Morse, M.S. (West. Res. U.), *Clinical Instructor.*
Nancy Mosley, B.S. (Med. C. Va.), *Clinical Instructor.*
Paul J. Parsons, B.S. (SUNY), *Instructor.*
John J. Petronis, B.A. (E. Stroudsburg St. C.), Cert. P.T., *Instructor.*
Carl Pfirman, B.S. (Penn. St. U.), Cert. P.T., *Clinical Instructor.*
Mary Rambo, B.S. (U. Pitt.), Cert. P.T., *Clinical Instructor.*
Stanley Wendkos, M.S. (Temple U.), *Clinical Instructor.*
Virginia Williams, M.S. (U. Wisc.), *Clinical Instructor.*

Admission to Professional Program

Official enrollment forms are available at the office of the Assistant to Dean, Admissions and Records, Medical Center, beginning December 1 of each year. Application forms should be returned no later than March 1 in the year admission is desired.

A personal interview with the Admissions Committee is required of all candidates. The committee will advise the applicant of time and place of interview.

Complete information concerning WVU admission, registration, fees and costs, regulations, etc. may be found in Part 2 of this *Catalog*.

CURRICULUM PLAN
Pre-Physical Therapy

This curriculum is designed to satisfy the course requirements for admission to the professional portion of the curriculum in Physical Therapy offered by the School of Medicine. The Core Curriculum requirements must be satisfied, and a total of 62 hours is required for admission to the first professional year. This suggested curriculum plan allows latitude in career choice and is basically compatible with various curricula in the arts and sciences.

First Year

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
English 1	3	English 2	3
Psych. 1**	3	Psych. 2**	3
Chem. 11**	4	Chem. 12**	4
Phys. Ed. 1	1	Phys. Ed. 2	1
Electives *	6	Electives*	6
	17		17

Second Year

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Physics 1**	4	Physics 2**	4
Biol. 1**	4	Biol. 2**	4
Psych. 141**	3	Psych. elect.**	3
Electives*	6	Sp. Com. 11**	3
		Electives*	3
	17		17

*Suggested electives: Foreign Language (6 hr.); Math. 3, 4; Stat. 101; Logic; Bus. Law 111; Psych. 164, 242, 281, 282; Biol. 266; Finan. 114, 150.

**Courses required for admission to Division of Physical Therapy. Chem. 15 and 16 are recommended because they are basically compatible with other curricula.

Physical Therapy

Third Year

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Path. 128	2	Physiol. 141	4
Anat. 101	4	Anat. 102	3
Anat. 103	2	Anat. 208	2
P.T. 111	5	P.T. 110	3
P.T. 113	1	P.T. 112	3
P.T. 115	3	P.T. 114	2
		P.T. 116	1
	17		18

Fourth Year

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
P.T. 271	4	P.T. 270	3
P.T. 273	3	P.T. 272	2
P.T. 275	3	P.T. 274	4
P.T. 277	3	P.T. 276	3
P.T. 279	4	P.T. 278	5
P.T. 281	1	P.T. 282	1
	18		18

Summer

	Hr.
P.T. 290	1-6

Courses of Instruction in Physical Therapy

(Courses included in the physical therapy curriculum, but not listed here, may be found in the Medical Center Basic Sciences section of the *WVU Graduate Catalog* or School of Medicine reprint of that catalog.)

110. *Functional Anatomy.* II. 3 hr. The musculoskeletal and neuromuscular systems including bio-mechanics, principles of movement, and analysis of muscle and joint action. Abnormal function due to physical disabilities and pathological disturbances. Students study normal human development and maturation through laboratory sessions involving evaluation and observation of children ranging in age from newborn to 5 years.

111. *Physical Therapy Principles and Therapeutic Exercise.* I. 5 hr. Lecture-laboratory introduction to physical therapy and general orientation to the patients. Nursing techniques related to physical therapy. Safety procedures, gait training, and traditional forms of exercise. Range of motion (goniometry) and posture and body measurements.

112. *Pulmonary Physical Therapy.* II. 3 hr. Correlation of anatomy, physiology, pathology, and treatment of pulmonary conditions. Laboratory in pulmonary evaluations and respiratory treatment procedures. Lectures and case presentations in medicine and surgery concerning chest and thoracic conditions.

113. *Psychiatry.* I. 1 hr. Psychiatric disorders and application of physical therapy to specific conditions. Theories and psychosocial aspects of aging.

114. *Medicine and Neurology.* II. 2 hr. Lectures and case presentations in medicine including GI, hematology, endocrinology, dermatology, physiology of aging, and infectious diseases. Orientation to neurology and neurological disorders.

115. *Physical Agents.* I. 3 hr. Lecture and laboratory orientation to theory and application of hydrotherapy, thermotherapy, cryotherapy, actinotherapy, massage, and ultrasound.

116. *Clinical Education I.* II. 1 hr. The physical therapy department, equipment, and procedures. Students observe patient treatment by experienced therapists and perform basic treatment procedures under direct supervision.

270. *Organization and Management.* II. 3 hr. Basic principles and philosophy of organization and management. Emphasis on budget planning, scheduling, records, ethics and legal aspects of practice, personnel policies, and leadership.

271. *Electrotherapy and Electromyography.* I. 4 hr. Orientation to theory and application of electrical currents. Laboratory experience in electrical diagnosis and treatment procedures. Basic principles and actual clinical experience with patients offered in electromyography, including nerve conduction and needle insertion studies.

272. *Professional and Community Relationships.* II. 2 hr. Community health organization, including local, state, and national facets such as Medicare-Medicade and welfare. Planning based on chronic disease epidemiology. Role of physical therapist and other allied health personnel in providing comprehensive health care for chronically ill and geriatric population. Students become involved in care of the home-bound patient.

273. *Physical Evaluation.* I. 3 hr. Principles and techniques of performing evaluation testing procedures within the scope of the physical therapist, including manual muscle testing, neurological and ADL evaluations.

274. *Orthopedic Physical Therapy.* II. 4 hr. Selected lectures and cases in orthopedics. Emphasis on effects and treatment of disease and injury to musculo-skeletal and neuromuscular systems. Laboratory practice in orthopedic assessment and procedures, including manipulation techniques.

275. *Professional Literature and Research.* I. 3 hr. Current literature method writing, statistics, and introduction to research methodology. A senior project is required.

276. *Elective Study.* II. 3 hr. Highly skilled techniques used in physical therapy are many and varied. It is beyond the scope of any baccalaureate program to offer such skill to every student in all areas. Therapists are beginning to specialize in certain areas. The student chooses a particular area and develops it to the student's fullest capabilities in the allotted time.

277. *Professional Communications.* I. 3 hr. Acquaints the student with various forms of communication — oral, visual, and written — and their value, function, and application to medical social fields. Emphasis on the physical therapist as a teacher. Students develop skill and techniques in the facilitation of learning, objective writing, and evaluation in both clinic and didactic settings. Students are required to demonstrate such skills to peer groups, faculty, staff, and other health related personnel.

278. *Correlative Rehabilitation.* II. 5 hr. Lecture, case presentations, and laboratory practice concerning the pathology, evaluation, and treatment in the areas of spinal cord injuries, amputations, and burns. Underlying philosophy and principles of comprehensive care of the handicapped. Prosthetics, orthotics, bowel and bladder training, assistive and supportive devices, and wheelchair evaluations.

279. *Advanced Therapeutic Exercise.* I. 4 hr. Correlation of the basic principles acquired from study of gross anatomy, neuroanatomy, pathology, physiology, and functional anatomy with the scientific application of bodily movement. In-depth study of types and desired effects of exercise and methods and techniques primarily con-

cerned with neuromuscular re-education. Laboratory practice consists of application of specific neurophysiological techniques to patients presented with various neuromuscular problems.

281. *Clinical Education II.* I. 1 hr. Continuation of P.T. 116. The student's participation in treatment programs is increased and enlarged to include rehabilitation techniques and basic testing and evaluation procedures.

282. *Clinical Education III.* II. 1 hr. Supervised experience in more specialized procedures and testing techniques and inpatient program design.

290. *Clinical Education IV.* S. 1-6 hr. Three summer affiliations of six weeks each in a variety of extramural facilities, such as a general hospital, children's facilities, rehabilitation services, and public health.

These WVU physical therapy students aren't victims of a mass accident. They're spending 24 hours on crutches to develop an understanding of how patients feel using them.

Radiologic Technology

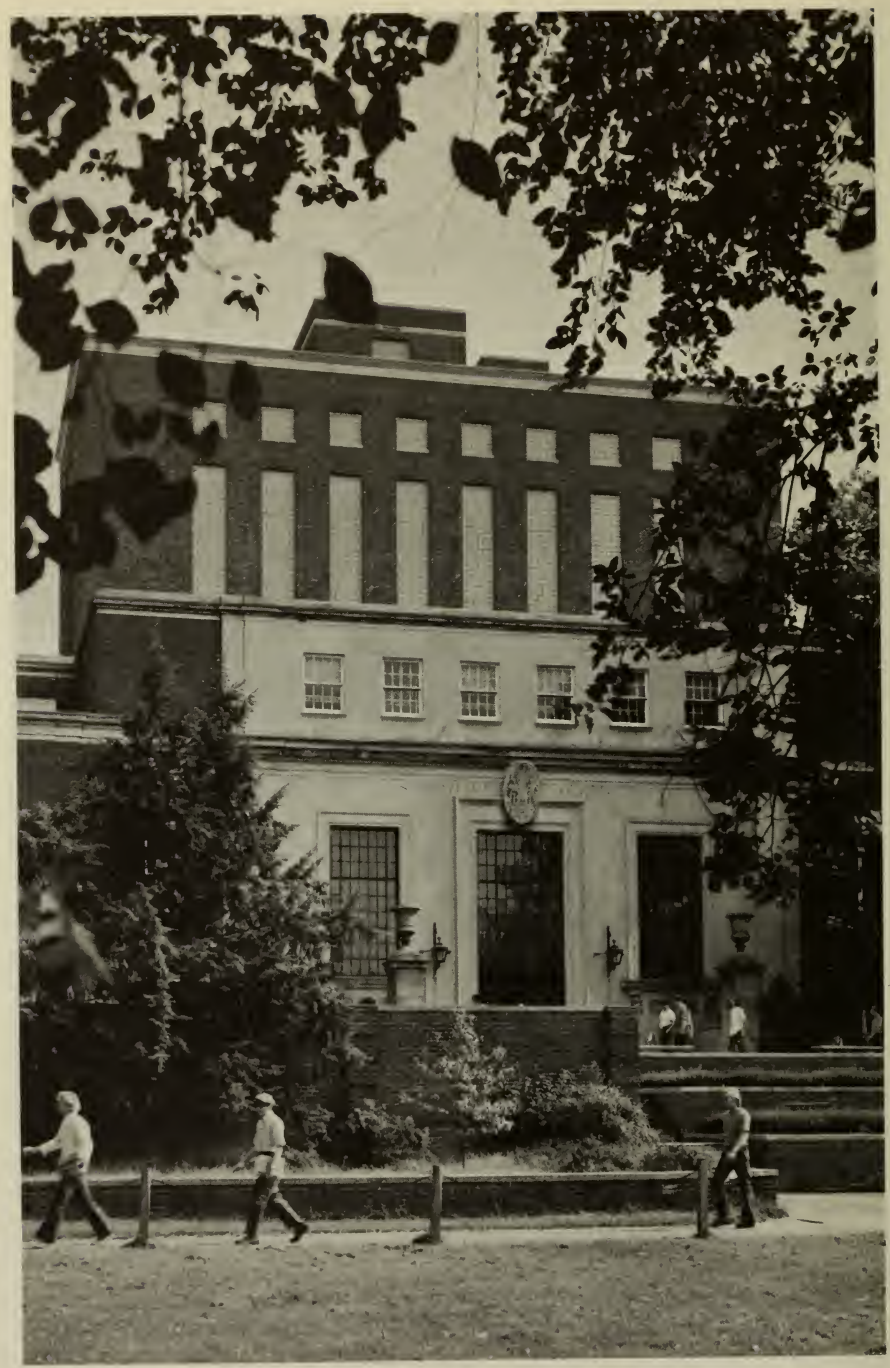
A two-year course for radiologic technologists is offered by the Department of Radiology at University Hospital. This course is covered by lectures, group discussions, anatomy and physiology, radiologic physics, radiographic techniques, radiation therapy, radioisotopes, medical terminology, nursing procedures, administration and professional ethics, as these pertain to the training of X-ray technologists. Subjects taken do not carry college credits. Practical experience is gained on assigned tours of duty under the supervision of staff members.

Candidates must be graduates of accredited high schools with scholastic and personal records acceptable to the Admission Committee.

Students of the Radiologic Technology course provide their own lodging and meals.

The admission fee is $100, but there is no annual tuition. Upon completion of the program, a certificate is awarded each student and who is then eligible to take the American Registry Examination.

Communications should be addressed to: Coordinator, Radiologic Technology Training, Department of Radiology, West Virginia University Hospital, Morgantown, WV 26506.



MILITARY SCIENCE (ROTC)

Division of Military Science (ROTC) and Air Force Aerospace Studies (ROTC)

West Virginia University offers qualified applicants two and four-year courses of instruction in Military Science (ROTC) and Air Force Aerospace Studies (ROTC). Normally, successful completion of one of these courses and degree requirements leads to a commission as second lieutenant in the U.S. Army Reserve or the U.S. Air Force Reserve. Outstanding students may be offered regular commissions.

Equivalent credit for part or all of the four basic semesters of ROTC may be granted in accordance with existing service regulations. This credit will be awarded on the basis of: prior active military service, high school ROTC, military school (Army ROTC at high school level), attendance at service academies, junior college senior division Army ROTC, or Civil Air Patrol training.

Under the Selective Service Act of 1967, as amended, all cadets enrolled in ROTC programs may be deferred by the Professor of Military Science or the Professor of Aerospace Studies from military service until completion of their military courses and receipt of the baccalaureate degree and commission. Such deferment may be cancelled if the student is not selected for retention in ROTC, fails to remain in good standing, or fails to develop the qualities required of an officer. Also, induction orders for designated applicants for the two-year ROTC program may be postponed effective the beginning of the second semester preceding the student's enrollment in advanced ROTC. After acceptance and enrollment in advanced ROTC, designated applicants receive deferments as stipulated for cadets in the four-year program.

Deposit

Each ROTC student is required to pay a yearly deposit of $20.00 to cover any loss or damage to issued property in his possession. The deposit is paid to the WVU Comptroller at the time of registration and is refunded, less a nominal yearly administrative and service charge, upon return of the undamaged property. Cadets are permitted to keep their uniforms upon successful completion of the program.

Military Science (U.S. Army)

Faculty and Staff

Duquesne A. Wolf, COL, M.S., *Professor.*
William H. Lockhart, LTC, B.G.E., *Assistant Professor.*
Bobby J. Getz, MAJ, B.S., *Assistant Professor.*
James N. Hawthorne, Jr., CPT, M.S., *Assistant Professor.*
Lynn W. Kling, CPT, M.Ed., *Assistant Professor.*
Bobby Timms, SGM, *Sergeant Major.*
Richard H. Thomas, MSG, *Instructor.*

Mission

The Military Science curriculum is designed to qualify selected male and female college students for commissioning as officers in the U.S. Army Reserve. Students who have demonstrated academic and military excellence will be given the opportunity to apply for a commission in the Regular Army. Students who meet the criteria for a Regular Army commission will be designated Distinguished Military Students.

Scholarship Program

Scholarships are available for one, two, three, and four years. Students awarded scholarships will receive a subsistence allowance of $100 per month during the academic year. The government will pay for the cost of tuition, fees, and textbooks. One, two, and three year scholarships can be applied for through the office of the Professor of Military Science.

Allowances

Students enrolled in advanced ROTC and all scholarship students receive a subsistence allowance of $100 per month during the academic year.

Flight Instruction Program

Students who apply for and who meet the physical and mental requirements for flight training may be enrolled in the Flight Instruction Program at no cost to themselves. During the senior year such students will attend ground school and flight training at the Morgantown Municipal Airport. Successful completion of the program will qualify the student as a private pilot. The student, upon commissioning, may be considered for Army aviation training.

Summer Camp

Before a student can be commissioned, the student must attend a 6-week ROTC Advanced Camp between the junior and senior years. Cadets will receive travel allowances and one-half the pay of a second lieutenant. Selected cadets may, on a voluntary basis, attend airborne school in addition to the Advanced Camp or ranger school in lieu of summer camp.

Two-Year Program

Selected students who apply will be enrolled in a two-year program that leads to an Army commission. The two-year student will attend one 6-week Basic ROTC camp before beginning the advanced course in addition to completing the requirements of the advanced course including the Advanced Camp.

Courses of Instruction

Basic Course — First Year (Army)

Mil Sci. 1. 2 hr. The U.S. defense establishment. Organization of the Army and ROTC. Historical growth and development of the U.S. Army. Significance of military discipline; courtesies, customs, and traditions of the service. Leadership development through practical exercises. Introduction to service weapons and firing of the .22 rifle. Two class hours, one lab hour (averaged) per week.

Mil Sci. 2. 2 hr. The U.S. defense establishment (continued). Structure of the Department of Defense and its relationship to other elements of the U.S. Government. Structures, roles, and interrelationships of the armed services with emphasis on the U.S. Army. Basic map reading course. Two class hours, one lab hour (averaged) per week.

Basic Course — Second Year (Army)

Mil Sci. 3. 2 hr. Operations of the basic military team to include a review of the use of maps and military geography. Continuing development of leadership through practical exercises in the functions, duties, and responsibilities of junior leaders. Two class hours, one lab hour (averaged) per week.

Mil Sci. 4. 2 hr. Development of American military institutions, policies, experience, and traditions in peace and war from colonial times to the present. Two class hours, one lab hour (averaged) per week.

Advanced Course — Third Year (Army)

Mil Sci. 105. hr. PR: Basic course or equiv. (Equivalent credit may be granted by the WVU Dean of Admissions and Records and the Professor of Military Science on the basis of prior military service, or ROTC training other than courses in Military Science taken at WVU.) Fundamentals of leadership and the exercise of command; preparation, presentation, and evaluation of instruction; review of the American role in world affairs. Three class hours, one lab hour (averaged) per week.

Mil Sci. 106. 3 hr. PR: Mil. Sci. 105 or consent. Roles of the various branches of the Army; fundamentals of small-unit tactics; practical training in preparation for Summer Camp. Three class hours, one lab hour (averaged) per week.

Advanced Course — Fourth Year (Army)

Mil. Sci. 107. 3 hr. PR: Mil Sci. 105 and 106 or consent. Stresses responsibilities in leadership and affords experience through performance as cadet leaders. Study of personnel management, logistical operations, military justice, military intelligence, and operational duties. Three class hours, one lab hour (averaged) per week.

Mil Sci. 108. 3 hr. PR: Mil. Sci. 105, 106, and 107 or consent. Leadership experience through performance in drill and selected tactical classes. Fundamentals and dynamics of the military team and a continued review of the American role in world affairs. Three class hours, one lab hour (averaged) per week.

Aerospace Studies (U.S. Air Force)

Faculty and Staff

Howard A. Thornhill, COL, M.A., *Professor.*
Ralph P. Hunt, MAJ, M.Ed., *Assistant Professor.*
L. Kent McBee, CAPT, M.A., *Assistant Professor.*
David D. Calvert, CAPT, M.S.I.E., *Assistant Professor.*
Gerald F. Gude, CAPT, M.S.B.A., *Assistant Professor.*
William L. Bush, CAPT, M.B.A., *Admissions Counselor.*
Gene A. Burgess, TSG, *Sergeant Major.*
Harold R. Easterling, TSG, *Personnel Specialist.*
Woodrow W. Hileman, Jr., SSG, *Administrative Specialist.*
James R. Hutchison, SSG, *Administrative Specialist.*

Mission

Men and women preparing for college graduation are faced with making many decisions that will set the course for your futures. Should I pursue an advanced degree? Should I accept an early employment opportunity? Should I consider marriage? What about the Peace Corps, Vista, and the other volunteer agencies? There are really many monumental considerations. An awareness that as the "now" generation you have a moral obligation to serve mankind as well as yourselves, makes you an important segment of the population. Since you are a member of that group, the U.S. Air Force has a special interest in you. We have long been proud of the traditions from which our service was born as well as our ability to set the pace in our technological society. The Air Force leadership spares no effort to provide opportunities and benefits that will sustain the high esprit de corps of its members.

The Air Force officer education program at WVU has been in existence since 1946 and is designed to provide training that will develop managerial skills and interpersonal attitudes vital to the professional Air Force officer. It is designed to qualify those college men and women for commissioning who desire to serve in the U.S. Air Force. For these people, the vital questions of the future have been answered and they are pressing forward toward their goals through Air Force ROTC.

Scholarship Program

Outstanding students from any academic discipline may apply to and be accepted by the Professor of Aerospace Studies to compete for scholarships under this program.

For students awarded scholarships the government will pay for the cost of tuition, fees, and textbooks, as well as provide $100 monthly allowance.

Scholarships of this nature are available for two, three, and four years.

Benefits

Those enrolled in the Professional Officer Course and all scholarship students are eligible for:

1. An allowance of $100 per month during the academic year.
2. Space-available travel aboard government aircraft at no cost.

Flight Instruction Program

Students qualified and selected for the pilot category (IP) will be given ground instruction and 36½ hours of flight training at no cost. It is recommended that eligible students receive ground instruction through enrollment in Aerospace Engineering 170, a 3-credit, FAA-approved course of instruction. An intensive 15-hour ground instruction course for no credit is available within the Aerospace Studies Department for those students unable to enroll in the AE course. The ground instruction phase in normally completed during the first semester of the senior year. Flight training, conducted at Morgantown Municipal Airport, normally is taken by students during the second semester of their senior year. No effective credit is given for this instruction.

Distinguished AFROTC Graduate

The Professor of Aerospace Studies may designate as a Distinguished AFROTC Graduate a professional officer's course (POC) member who:

1. Has a superior academic record and high AFOQT score.
2. Possesses outstanding qualities of leadership and high moral character.
3. Demonstrates leadership ability through achievement in recognized campus activities, both curricular and non-curricular, which, in conjunction with 1 and 2 above, warrants designation as "Distinguished".

Air Force Academy

The President of WVU may annually nominate three outstanding AFROTC students to be enrolled in the U.S. Air Force Academy. Applications for the nomination are recommended by the Professor of Aerospace Studies to the President of WVU during January of each year.

Field Training

Applicants for the professional officer course must attend a summer Field Training Course before entering their junior year. Students who have completed the GMC are assigned to a 4-week training unit; however, students who did not complete the GMC must attend a more intensive 6-week course. The Air Force will furnish uniforms, housing, medical care, and rations in addition to giving students round-trip travel allowance and military pay. Students who successfully complete Field Training then become eligible for the professional officer course.

Curriculum

The curriculum in Air Force Aerospace Studies is divided into three distinct areas: the general military course, corps training, and the professional officer course.

General Military Course

The Air Force course of study offered during the freshman and sophomore years is the general military course (GMC). This is composed of one class hour and one corps training hour per week. Two credit hours are allowed for each semester course successfully completed. Four semesters of the GMC is one means of admission to the professional officer course. However, a two-year

Professional Officer Course option is available for those students who do not complete the GMC.

GMC — First Year

AF Aerospace Studies 1. 2 hr. The doctrine, mission, and organization of the U.S. Air Force; U.S. strategic offensive and defensive forces: their mission and function.

AF Aerospace Studies 2. 2 hr. Aerospace defense; missile defense; U.S. general purpose and aerospace support forces; the mission, resources, and operation of tactical air forces, with special attention to limited war; review of Army, Navy, and Marine general purpose forces.

GMC — Second Year

AF Aerospace Studies 3. 2 hr. The development of air power including doctrine, technology, organization and utilization; leadership and managerial communication skills are stressed by having students prepare both written and oral presentations.

AF Aerospace Studies 4. 2 hr. Continuation of AFAS 3.

Corps Training

Corps training is taken an average of one hour per week throughout the student's enrollment in AFROTC. Instruction is conducted within the framework of an organized cadet corps with a progression of experiences designed to develop each student's leadership potential. Corps training involves a study of Air Force customs and courtesies; drill and ceremonies; career opportunities in the Air Force; and the life and work of an Air Force junior officer. Students develop their leadership potential in a practical, supervised training laboratory, which typically includes field trips to air force installations throughout the U.S.

Professional Officer Course

The Professional Officer Course (POC) corresponds to the junior and senior years of a student's academic course. Enrollment in the advanced course is also open to graduate students if they have four semesters of school remaining.

POC is designed to provide highly qualified junior officers for the United States Air Force. Enrollment in the program is based upon such factors as scholarship, physical qualifications, leadership, desire for flying training, and academic major. Successful completion of the advanced course qualifies the student for appointment as a second lieutenant in the U.S. Air Force Reserve.

Instruction averages three hours per week throughout the four semesters in addition to the Corps Training hours required. Three hours of credit are allowed for each of the four semesters work in the advanced program subsequent to acceptance by each school or college in the University.

To be eligible for enrollment into the POC, students must meet the following requirements:

1. Make application for the POC at the beginning of the second semester of the sophomore year.
2. Be physically qualified in accordance with Department of Air Force standards.
3. Be under 30 years of age at the time of commissioning, except that pilot and navigator applicants must not be older than 26½ years when commissioned.
4. Complete the GMC and field training courses or have equivalent credit in lieu thereof.

5. Pass the Air Force Officer Qualifying Test (AFOQT)

6. Have a minimum cumulative grade-point average of 2.0.

7. Have four semesters of undergraduate or graduate school remaining.

8. Enlist in the Air Force Reserve for a period of six years — eight years for those in the college scholarship program.

9. Execute a written agreement to complete the advanced course and attend a summer field training course.

10. Agree to accept a commission as a second lieutenant in the USAF Reserve and serve at least four years if not on flying status, or six years if pilot or navigator qualified.

11. Be accepted by the Professor of Air Force Aerospace Studies.

POC — Third Year

AF Aerospace Studies 105. 3 hr. PR: GMC or equiv. (Equivalent credit may be granted by the WVU Dean of Admissions and Records and either the Professor of AF Aerospace Studies on the basis of prior military service, or ROTC training other than courses in Aerospace Studies taken at WVU.) American defense policy; strategy and the use of force; bureaucracy and technology; military sociology. Leadership and managerial skills are stressed through written and oral class presentations.

AF Aerospace Studies 106. 3 hr. PR: AFAS 105 or consent. Current national security strategy of realistic deterrence and management of defense resources; evaluation of modern aerospace weapons systems, space operations, and future roles and missions for the U.S. Air Force.

POC — Fourth Year

AF Aerospace Studies 107. 3 hr. PR: AFAS 105, 106 or consent. Military law, management, command and staff policies, and seminar of leadership theory and career opportunities within the Air Force.

AF Aerospace Studies 108. 3 hr. PR: AFAS 105, 106, 107 or consent. Study of human relationships, problem-solving techniques, management and leadership case studies; seminar on the junior officer in the Air Force.

School of Mines

Today's opportunities in the mineral industry never have been greater. Energy is the watchword. Mining and petroleum engineers move into top management positions fast — general managers, chief engineers, vice-presidents, and presidents. Many of WVU's 500 mining and petroleum engineering graduates have achieved positions of such prominence in the mineral extractive industry. With this country placing more importance on economical and alternate sources of materials and energy, this is your opportunity to become part of one of our nation's most vital industries.

Fossil fuel engineering is a profession which brings into play a broad range of skills and activities — planning, supervising, and operating all types of mineral extractions, both above and below ground. Mining engineering is the science of producing solid fuels and metals — including coal, lignite, oil shale, iron, copper, gold, aluminum, and uranium. There also are the non-metallic minerals such as limestone and diamonds. If you are interested in petroleum or natural gas, engineering courses in the School of Mines cover the exploration, drilling, production, and evaluation of oil and natural gas reservoirs. You also may want to take courses in mineral processing and mineral resource and energy economics. National and regional problems associated with growing energy demands make it important for engineers of the future to include economics and process engineering in their studies.

Located in the center of one of the greatest mineral producing areas of the country, the School of Mines is near industrial, mining, petroleum, and natural gas-producing areas. It encourages faculty and students to participate in research, industrial consultation, and membership in professional mineral engineering societies and activities. The School of Mines also has a cooperative program with participating companies which permits students to attend WVU half a year and work for the participating company the other half. And the money you earn, in most cases, takes care of all your educational expenses. Summer employment is available also. As a matter of fact, one of the world's largest coal producers has a policy of hiring any WVU mining student for summer employment if he or she so wishes. In addition, a number of the largest oil and gas companies with facilities in West Virginia also provide summer employment for students enrolled in the petroleum engineering department of the School of Mines.

Faculty

Jay Hilary Kelley, Ph.D. (Penn. St. U.), *Dean.*

Mining Engineering

Arthur Lee Barrett, B.S.E.M. (U. Ill.), *Adjunct Professor.*
Charles T. Holland, P.E., M.S.E.M. (WVU), *Professor Emeritus.*
Jay Hilary Kelley, Ph.D. (Penn. St. U.), *Professor.*
Donald Kingery, B.S. (Ohio St. U.), *Adjunct Professor.*
Calvin J. Konya, Ph.D. (U. Rolla), *Assistant Professor.*
Joseph W. Leonard, M.S. (Penn. St. U.), *Associate Professor.*
Joseph D. McClung, P.E., M.S.E.M. (U. Pitt.), *Associate Professor.*
Jan M. Mutmansky, P.E., Ph.D. (Penn. St. U.), *Associate Professor.*
E. J. Sandy, P.E., M.S.E.M. (U. Pitt.), *Associate Profesor.*
Earle P. Shoub, B.S. (Brooklyn Tech), *Adjunct Professor.*

Petroleum Engineering

Abdel K. Kotb, P.E., Ph.D. (U. Okla.), *Associate Professor.*
Richard W. Laird, P.E., M.S.E.M. (WVU), *Professor.*
Herman H. Rieke, Ph.D. (U. So. Calif.), *Assistant Professor and Engineering Scientist.*
James A. Wasson, P.E., M.S.P.E. (Penn. St. U.), *Associate Professor.*

Mineral Economics

Richard T. Newcomb, Ph.D. (U. Minn.), *Professor.*
Kenneth K. Humphreys, P.E., M.S. (WVU), *Associate Professor.*

Mineral Processing Engineering

Duane R. Skidmore, Ph.D. (Fordham U.), *Professor.*
Leonard M. Bianchi, M.S. (Rensselaer Poly. Inst.), *Associate Professor.*
Suresh P. Babu, Ph.D. (Ill. Inst. Tech.), *Assistant Professor and Engineering Scientist.*
Richard B. Muter, M.S. (WVU), *Instructor and Engineering Scientist.*

Coal Research Bureau

Joseph W. Leonard, P.C., M.S. (Penn. St. U.), *Director and Associate Professor.*
Kenneth K. Humphreys, P.E., M.S. (WVU), *Assistant Director and Associate Professor.*
David J. Akers, Jr., B.S. (WVU), *Research Technician.*
Suresh P. Babu, Ph.D. (Ill. Inst. Tech.), *Assistant Professor and Engineering Scientist.*
William H. Buttermore, B.S. (WVU), *Research Technologist.*
Lionel L. Craddock, M.S. (WVU), *Research Assistant.*
Harold V. Fairbanks, M.S. (Mich. St. U.), *Research Fellow.*
Mary Alice Hannah, B.S. (WVU), *Research Technician.*
William F. Lawrence, B.S. (Waynesburg C.), *Associate Engineering Scientist.*
James D. McClung, M.S. (WVU), *Engineering Scientist.*
Phil O. McClung, B.A. (WVU), *Research Technician.*
Barry G. McMillan, B.S. (WVU), *Research Technician.*
Charles R. McFadden, B.S. (WVU), *Research Technologist.*
Richard B. Muter, M.S. (WVU), *Instructor and Engineering Scientist.*
Larry L. Nice, M.B.A. (WVU), *Research Technologist.*
John F. Slonaker, B.A. (Wash. & Jeff. C.), *Project Supervisor.*

Mining and Industrial Extension

Thomas L. Savage, B.S. (Cornell U.), *Assistant Director.*
Donald M. Bondurant, P.E., B.S. (Ohio St. U.), *Supervisor, Industrial Extension.*
Joseph Dorton (Concord C.), *Instructor.*
L. Bennett Ferguson, *Instructor.*
Robert Halstead, B.S. (Morris Harvey C.), *Instructor.*
Peter P. Mintreas, B.S. (WVU), *Instructor.*
Herman Sparks, M.A. (WVU), *Instructor.*
Lloyd B. Tolbart, B.S. (Concord C.), *Instructor.*
Leland H. Winger, B.S. (WVU), *Instructor.*
Duane A. Letcher, M.S. (S.D. St. U.), *Instructor.*

ECPD Accreditation

The Engineer's Council for Professional Development (ECPD), a joint body concerned with the enhancement of the status of the engineer and the engineering profession, has been designated by its constituent bodies (American Society of Civil Engineers, American Institute of Mining, Metallurgical and Petroleum Engineers, American Society of Mechanical Engineers, Institute of Electrical and Electronics Engineers, American Society for Engineering Education, American Institute of Chemical Engineers, American Institute of Aeronautics and Astronautics, National Council of State Boards of Engineering Examiners, American Institute of Industrial Engineering and Engineering Institute of Canada) as the coordinating agency for the accrediting of undergraduate engineering curricula in the United States.

The mining and petroleum engineering curricula are fully accredited by the ECPD.

Admissions

Examination or a transcript from an accredited high school is the first step for admission. These are the requirements: (1) Four units of English; (2) Two units of algebra; (3) One unit of geometry; and (4) One-half unit of trigonometry.

If you can't meet these requirements in mathematics, you can apply for admission to the pre-mining curriculum.

One other thing. All students entering as first-semester freshmen must take the American College Testing Program tests (ACT) and have the scores forwarded to WVU. This is used for academic placement purposes and no other test may be substituted for it.

Complete information concerning WVU admission, registration, fees and expenses, regulations, etc. may be found in Part 2 of this *Catalog*.

Requirements for Degrees

Any student in order to be eligible for a bachelor's degree in any branch of engineering for which degrees are offered, in addition to satisfying all entrance requirements, shall be required to complete satisfactorily the number of semester hours of work as specified in the curriculum of the department leading to the degree for which the student is a candidate, plus the general requirements of physical education and English proficiency.

A grade of C or better must be attained in each mathematics course before registration in a subsequent mathematics course is allowed.

Professional Degrees

WVU confers the professional degrees of Engineer of Mines (E.M.) and Petroleum Engineer (Pet.E.). The professional degree is conferred upon graduates of the School of Mines on the basis of practical experience and study in absentia, the presentation of a thesis, and oral final examination. To be eligible, a candidate for the professional degree must have been in active practice of his profession for at least five years since receiving his first degree, and must have been in responsible charge of important work for at least two years.

Application for registration as a candidate for a professional degree should be made not later than October 1 in the academic year in which the degree is desired. Detailed regulations and registration blanks may be obtained from the Dean of School of Mines.

Curricula

The following engineering curricula are offered in the School of Mines.

1. A four-year curriculum leading to the degree of Bachelor of Science in Engineering of Mines.

2. A four-year curriculum leading to the degree of Bachelor of Science in Petroleum Engineering.

3. A combined science and engineering curriculum leading to the degree of Bachelor of Science and Bachelor of Science in Engineering of Mines or Bachelor of Science in Petroleum Engineering.

In the four-year curricula the first two years of instruction are alike. During this period the student is given a thorough grounding in mathematics, physics, chemistry, English composition, and geology, as well as an introduction to history and economics. During the third and fourth years, the student is given instruction in the engineering sciences as well as in the professional subjects pertaining to mining engineering and petroleum and natural gas engineering. Also, studies in the humanities are continued with the student being permitted to elect a reasonable proportion of the subjects to be studied.

Lower Division — School of Mines

First Year				Second Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Chem. 141	4	Math. 18	4
Math. 15	4	Math. 16	4	Math. 17	4	Physics 12	4
English 1	3	English 2	3	Physics 11	4	Geol. 151	3
Geol. 1	3	M. 2	3	M.E.M. 51	4	M.E.M. 52	4
M. 1	3	Phys. Ed. 2	1	Major	1	Core elect.	3
Phys. Ed. 1	1	Core elect.	3				
	18		18		17		18

Engineering of Mines

Degree: Bachelor of Science in Engineering of Mines

Mining Engineering deals with discovering, extracting, beneficiating, marketing, and utilizing minerals from the earth. The role of the mining engineer is quite diversified and there are opportunities for technical specialization in prospecting, development, production, beneficiating, utilization, and marketing. Therefore, the mining engineer must be well trained in the fields of mining and geology and also in the principles of civil, electrical, and mechanical engineering as applied to the mining industry. With the present trend toward the use of engineers in industrial management and administrative positions, the mining engineer's training must also include economics, business, personnel management, and the various humanities.

In this curriculum professional study includes geology and the engineering principles of blasting, materials handling, transportation, hoisting, water control, surface and underground systems of mining, roof control, ventilation, mineral preparation, and plant design. Special consideration is given to the application of mining machinery with particular attention to power transmission and electric and hydraulic control systems.

Special courses in the design of surface and underground mining installations give the student opportunity to use the engineering principles developed in preceding phases of the course, as well as for specialization. The student receives an introduction to the management and social aspects through courses devoted to economic, social, governmental, labor, financial, and safety problems incidental to the operation of a mining enterprise.

In the fourth year the student may specialize in coal mining, ore mining, or other phases of mining engineering by proper selection of design problems and electives. The student will be assigned an adviser who will assist in this phase of the program.

Local coal fields, mines, and preparation plants are used extensively for experimental, instructional, and field work.

Mining Engineering

Summer (3 weeks) — E.M. 102, 3 hr.
Third Year — Credit hours: 35
Fourth Year — Credit hours: 32
Total: 141 hours.

Petroleum Engineering

Degree: Bachelor of Science in Petroleum Engineering

Petroleum engineering deals with the discovery, production, and transportation of oil and natural gas. Consequently, the petroleum engineer must be thoroughly familiar with the principles of geology as related to the occurrence, discovery, and production of natural gas and petroleum. This knowledge is obtained by the study of geology as well as by the geological principles developed in courses relating to oil field development and production. In addition, the petroleum engineer must be well grounded in the principles of oil and gas production, as well as in the technology of transportation. This training may be obtained in the several courses pertaining to petroleum technology and in natural gas engineering and distribution, as well as the courses given in the engineering and basic sciences and in mathematics. There is a strong trend toward employing petroleum engineers as supervisors, managers, and executives. Education for this type of career is provided by the courses in property evaluation, as well as in economics and the humanities. In the senior year, electives are provided in which the student may obtain additional training in geology or geophysics, in management, in supervisory skills or in some special phase of petroleum and natural gas technology. Assistance in this phase of the program will be given by an adviser assigned to the student.

The School is particularly fortunate that West Virginia is a petroleum and natural gas producing state, and as a result local production and gas storage fields, secondary recovery projects, compressor stations and refineries provide excellent opportunities for field study of petroleum engineering problems, techniques, and methods. The petroleum laboratories of the School are well equipped for laboratory study of gas measurement apparatus and for core analysis, as well as for the study of drilling muds and for study of and experiments on drilling and pumping machinery.

Petroleum Engineering

Third Year				Fourth Year			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Pet.E. 210	3	Geol. 272	3	M.E.M. 101	3	Tech. elect.	2
Pet.E. 212	1	Core elect.	6	I.E. 213	3	Core elect.	6
Pet.E. 236	3	Major	9	Core elect.	6	Major	4
E.E. 105	4			Major	4	Mines elect.	3
C.E. 115	3						
Tech. elect.	3						
	17		18		16		15

Total: 137 hr.

Recommended Mines electives: M. 297, 250; Pet.E. 216, 224, 244, 340, 342, 343, 351, 352, 362, 394.
Technical electives include courses pertinent to the major field and offered outside the School of Mines.

Courses of Instruction

General Minerals Program

M.

1. *Mineral Engineering Problem Solving* I. 3 hr. Problem solving methods in mineral engineering with emphasis on holistic analysis. Information retrieval, literature searching, mineral resource investigations, mineral and energy use and demand patterns, surveying and mensuration techniques; use of mathematical and computer modeling, statistical, and probabilistic methods; computer applications in mineral engineering.

2. *Mineral Engineering Problem Solving.* II. 3 hr.

19. *Energy Technologies for the Future.* I. 3 hr. Technological aspects of the energy crisis with special attention to upcoming systems likely to influence energy production patterns; distribution modes and utilization methods.

20. *Materials Technologies for the Future.* II. 3 hr. Technological aspects of materials innovation and substitution. Upcoming changes in sources processing and utilization of materials.

97. *Man's Energy Needs and Resource Limitations.* 3 hr. Open to any WVU student. Dilemmas posed for backward and modern societies by rising energy demands amid concerns for the world's environment, given existing resource constraints. Conventional technologies and historical concerns over resource scarcities. Implications for welfare economics. Impact of technological change and both future and exotic energy systems.

98. *National Resource and Energy Policy Problems.* 3 hr. Open to any WVU student. Resource and energy policy problems as currently formulated and treated on a national level by the Department of the Interior, including mineral import quotas, prorationing, federal tax and land law policy, leasing, mineral research and education, health and social concerns. Use of confrontation by citizen action as a catalyst for changing mineral engineering practice.

106. *Mineralogy.* I. 2 hr. PR: Chem. 16. Surface and subsurface surveying, celestial observations, and related calculations. Intensive field practice in underground and surface surveying. Lectures and field work arranged.

200. *Elements of Mineral Conservation.* I. 3 hr. PR: Junior standing. Open to any WVU student. Economics of conservation for nonrenewable resources; traditional and modern views; new environmentalist concerns. Current and forecast demand and supply conditions for mineral and energy resources including coal, water, oil, gas, ores, and industrial minerals; causes of mineral loss and environmental costs in production and utilization; methods of environmental control and conservation in underground and surface mining.

207. *Introductory Seismology.* I. 1 hr. PR: Physics 11. Earthquakes, their causes and area distribution; theory of elastic waves; principles of seismograph construction, adjustment and operation; interpretation and calculation of seismograms with exercises provided by records of the University seismography station. 1 hr. lec.

230. *Elements of Geophysical Prospecting.* I. 3 or 4 hr. PR: Geol. 1, Physics 11. Locating subsurface oil, gas, and mineral deposits. Field investigation using instruments with 4 hr. section.

250. *Evaluation of Capital and Operating Costs in the Mineral Industries.* I. 3 hr. Estimating capital and operating costs of mineral industries. Evaluation of potential investments, comparisons of investment alternatives, estimation of profitability, and payout of new ventures. Special problems of investment decisions in mining, petroleum, and other facets of the mineral industries.

300. *Readings in Mineral Resource and Energy Economics.* I, II. 3 hr. Review of current mineral economics studies of the National Materials Policy Commission and National Academies.

381. *Theory and Policy of Mineral Economics.* II. 3 hr. Defines the pure theory of resources and energy allocation with technological, geological, and environmental constraints.

398. *Models of Mineral Commodity Markets and Industries.* II. 3 hr. PR: I.E. 280 or equiv. Econometric studies analyzing the behavior and problems of selected mineral industries and commodities from the viewpoint of the firm, industry, and region of interest.

Engineering of Mines

E.M.

102. *Mine Surveying.* SI. 3 hr. PR: Math. 15. Surface and subsurface surveying, celestial observations, and related calculations together with intensive field practice in underground and surface surveying. Lectures and field work arranged.

108. *Fundamentals of Mining.* I. 4 hr. PR: Geol. 1, Math. 17, Physics 12, E.M. 102. Mineral prospecting, drilling, explosives, mining methods for bedded deposits and ore bodies, timbering, and application of mining machinery. 4 hr. lec.

112. *Mine Plant Design.* II. 3 hr. PR: E.M. 212, M.E.M. 52 and C.E. 115 or concurrent enrollment. Applications of the principles of mechanics and mining technology to the analysis and design of mine building, head-frames, bins, skips and cages. 2 hr. lec., 3 hr. lab.

201. *Fire Control Engineering.* II. 3 to 4 hr. PR: Senior standing in an engineering curriculum or consent. Aspects involved in the control from fire, explosion, and other related hazards. Protective considerations in building design and construction. Fire and explosive protection organization including fire detection and control. Lectures (3) and/or 3 hr. lab.

209. *Mineral Preparation.* II. 3 hr. PR. M.E.M. 52, C.E. 115, or consent. Preparation, beneficiation, and concentration of metallic and non-metallic ores for further processing or utilization. 2 hr. lec., 3 hr. lab.

212. *Advanced Mining.* II. 3 hr. PR: E.M. 108 and PR or conc.: E.E. 105, Engineering principles, methods and equipment applied to mine transportation, hoisting, and drainage. 3 hr. lec.

213. *Mine Ventilation.* I. 3 hr. PR: E.M. 108, M.E.M. 52, and C.E. 115. Principles, purposes, methods, and equipment pertaining to the ventilation of mines. 2 hr. lec., 3 hr. lab.

215. *Industrial Safety Engineering.* I, II. 3 hr. PR: Junior standing or consent. Problems of industrial safety and accident prevention, laws pertaining to industrial safety and health, compensation plans and laws, and industrial property protection. 2 hr. lec.

216. *Mine Safety Engineering.* I. 3 hr. Analysis and application of mining health and safety laws to the work processes of the mining industry.

217. *Coal Preparation.* I. 3 hr. PR: E.M. 108, 209, or consent. Formation of coal, rank classification of coal, coal petrography, principles of preparing and beneficiating

coal for market with laboratory devoted to sampling, screen analysis, float and sink separation, and use of various types of coal cleaning equipment. 2 hr. lec., 3 hr. lab.

218. *Advanced Mineral Preparation.* I. 3 hr. PR: E.M. 209. Theory and practice of concentration of ores and industrial minerals with special consideration to more recent advances in beneficiation of ores and coal. 2 hr. lec., 3 hr. lab.

219. *Advanced Mining Methods for Vein Deposits.* II. 3 hr. PR: E.M. 108. Methods and systems of mining other than flat seams. Emphasis on selection of methods in relation to cohesive strength of ore bodies and their enclosing wall rocks. Mining of anthracite included. 3 hr. lec.

220. *Mine Design.* I, II. 3 hr. PR: E.M. 212, 213, 241. Comprehensive design problem involving underground mining developments or surface plant or both, as elected by the student in consultation with instructor. A complete report on the problem required, including drawings, specifications, and cost analysis. 9 hr. lab.

222. *Mine Equipment and Machinery.* II. 3 hr. PR: E.E. 106 and E.M. 212. Selection, installation, operation, and maintenance of mining equipment. 3 hr. lec.

223. *Mine Management.* II. 3 hr. PR: Math. 18, E.M. 108, 212 and senior standing. Economic, governmental, social, cost, and labor aspects of mining as related to the management of a mining enterprise. 3 hr. lec.

224. *Mining Engineering Problems.* I, II. 1-6 hr. PR: Senior or graduate standing or consent. Special problems in mining engineering, including choices among operations research, mine systems analysis, coal and mineral preparation, and coal science and technology.

228. *Mine Equipment and Machinery Controls.* I. 3 hr. PR: E.M. 222 or consent. Principles, application, and use of electric and hydraulic devices and circuits for protection and control of mine machinery and equipment. 3 hr. lec.

229. *Advanced Mining Equipment Applications.* II. 3 hr. PR: E.M. 228. Structural, mechanical, hydraulic, and electrical characteristics of the more common items of mining equipment. Controls, electrical and hydraulic circuits, and mechanical transmissions with associated problems. Laboratory design of a control system for a mining machine. 2 hr. lec., 3 hr. lab.

241. *Mechanics of Ground Control in Mines.* I. 3 hr. PR: M.E.M. 52, Math. 18, E.M. 108 or consent. Structure of the earth's crust, bedding planes, joints, heterogeneity, mechanical properties of rocks, stress-time-deformation, relationships in rocks, theoretical stress distribution about mine openings, practical effects, factors in mine pillar design, pillar bursts, creeps and squeezes, mining subsidence. 2 hr. lec., 3 hr. lab.

247. *Explosives Engineering.* I, II. 3 hr. PR: Chem. 16, M.E.M. 51, 52. Theory and application of explosives, composition properties and characteristics of explosives reactions, effects on materials, blasting design fundamentals, legal and safety considerations. 3 hr. lec.

249. *Rock Mechanics.* I. 3 hr. PR: M.E.M. 51, 52, or consent. Elastic and plastic properties of rock, Mohr's criteria of failure, elastic theory, stress distributions around underground openings, open pit and underground stability rock testing techniques. 2 hr. lec., 1 hr. lab.

290. *Surface Mining.* II. 3 hr. PR: E.M. 108, Geol. 151, M.E.M. 52, or consent. Open pit mining, quarrying, and stripping, with emphasis on planning, production, and equipment systems. Application of principles of mechanics to slope stability problems in rock. 3 hr. lec.

301, 302. *Advanced Mine Design.* I, II. Credit arranged. Advanced detail design and layout of coal mine plant, particularly incorporating new ideas of machines and mining methods.

Petroleum Engineering

Pet.E.

207. *Natural Gas Engineering.* I. 4 hr. PR: Pet.E. 211, C.E. 115. Principles of natural gas production, transmission, distribution, processing, regulation, measurement, storage, and analysis with a laboratory devoted to principles of equipment utilized in the operations. 3 hr. lec., 3 hr. lab.

210. *Drilling Engineering.* I. 3 hr. PR: Geol. 1, Math. 18. C.E. 115, I.E. 213. Rock properties, wellbore hydraulics, air and gas drilling factors affecting penetration rate, slimhole, lifting capacity liquid, air, or gas, two-phase flow, casing and casing string design, wellbore primary and squeezing cementing, minimum cost drilling. 3 hr. lec.

211. *Production Engineering.* II. 3 hr. PR: Pet.E. 210. Performance of productive formation, drill stem tests, completion of wells, flowing wells, gas lift methods and equipment, pumping installation design, well stimulation, emulsion, treating, gathering and storage of oil and gas, field automation. 3 hr. lec.

212. *Drilling Fluids Laboratory.* I. 1 hr. PR: Pet.E. 210, Chem. 141, C.E. 115. Drilling fluids control relative to pilot testing, drilling fluid design procedures and measurement of composition and properties. 3 hr. lab. and discussion.

216. *Petroleum Engineering Design.* II. 2-3 hr. PR: Pet.E. 234. Comprehensive problem in design involving systems in oil and gas production, field processing, transportation, and storage. Three 3-hr. labs.

224. *Petroleum Engineering Problems.* I, II. 1-6 hr. PR: Graduate or senior standing. Investigation and detailed report on a special problem in petroleum or natural gas engineering. Supervised by a member of the graduate faculty.

233. *Elements of Petroleum Reservoir Engineering.* II. 3 hr. PR: Pet.E. 236. Basic properties of petroleum reservoir rocks. Fluid flow through porous materials. Evaluation of oil and gas reserves. 3 hr. lec.

234. *Applied Petroleum Reservior Engineering.* I. 3 hr. PR: Pet.E. 233. Application of reservoir engineering data to calculation of recovery potentials and to analysis, simulation and prediction of reservoir performance under a variety of production methods to effect maximum conservation. 3 hr. lec.

235. *Formation Evaluation.* II. 3 hr. PR: Math. 17, Pet.E. 210 or consent. Various well logging methods and related calculations with exercises in interpretation of data from actual well logs. 2 hr. lec., 3 hr. lab.

236. *Mechanics of Hydrocarbon Fluids.* I. 3 hr. PR: Chem. 141. Qualitative and quantitative phase behavior of single and multicomponent hydrocarbon systems with emphasis on application to petroleum production engineering and petroleum reservoir engineering. 2 hr. lec., 3 hr. lab.

241. *Oil and Gas Property Evaluation.* II. 3 hr. PR: Pet.E. 211, 234, 235, Econ. 52. Petroleum property evaluation. Calculation of reserves and future reservoir performance, decline curves, production and formation testing, pressure transient analysis, reservoir test limit, analysis of data, curve fitting, evaluation of processing facilities and analysis of profitability. 3 hr. lec.

244. *Petroleum Reservoir Engineering Laboratory.* II. 1 hr. PR or Conc.: Pet.E. 233. Laboratory evaluation of basic and special petroleum reservoir rock properties.

300. *Hydrocarbon Production from Carbonate Rocks.* I. 3 hr. PR: Pet.E. 235, 241. Theory on the production of oil and gas from carbonate rocks, definition and classification of pore geometry, fluid flow characteristics, performance of carbonate rock reservoirs and stimulation of these reservoirs. 3 hr. lec.

301. *Advanced Petroleum and Natural Gas Engineering Design.* I, II. Credit arranged. PR: Graduate or senior standing. Advanced detail design problems in some phases of petroleum and natural gas exploration, production, and transportation, particularly incorporating new ideas, machines, and methods.

302. *Fluid Flow in Porous Media.* I. 3 hr. PR: Pet.E. 234, Math. 18 or consent. Theoretical and practical aspects of physical principles of hydrodynamics in porous media. 3 hr. lec.

340. *Secondary Recovery of Oil by Water Flooding.* II. 3 hr. PR: Pet.E. 234. Theory of immiscible fluid displacement mechanism, evaluation and economics of water flood projects, and oil field flooding techniques. 3 hr. lec.

342. *Well Stimulation: Fracturing.* I. 3 hr. PR: Pet.E. 241. Hydraulic fracturing; fracturing tools, fluids, and orientation; propping agents and general design treatment for optimum profitability. 3 hr. lec.

343. *Advanced Secondary Recovery.* I. 3 hr. PR: Pet.E. 340. Secondary recovery of oil by gas flooding, miscible fluid injection *in situ* combustion, and heat injection. 3 hr. lec.

351. *Thermodynamics of Reservoir Fluids.* II. 3 hr. PR: Pet.E. 241. Thermodynamic properties of single and multiphase hydrocarbon fluids. Processing natural gas and petroleum crudes and fluid dynamics of processed fluids. 3 hr. lec.

352. *Substitute Liquid Fuel Processes.* I. 3 hr. PR: Graduate or senior standing or consent. Heat and mass transfer and systematic methods of materials and energy balances. Energy conversion processes for coal gasification, retorting tar sands, oil shales, and underground natural gas. Substitute liquid fuel manufacturing processes from gaseous fuels, direct liquefaction of coal, and some unconventional sources discussed.

362. *Reservoir Simulation and Modeling.* II. 3 hr. PR: Pet.E. 302, Math. 18, I.E. 281, or consent. Finite difference equations and their applications for fluid flow equations in porous media, types of grids, explicit and implicit schemes, material balance equation for oil and gas reservoirs, solution of single-phase, two-phase and three-phase flow in one, two and three dimensions, simulation of depletion drive reservoirs, gas reservoirs, and other simulation methods. 3 hr. lec.

394. *Special Topics.* I, II. 1-6 hr. PR: Consent. Selected fields of study in petroleum and natural gas engineering.

Multidisciplinary Studies

Harold A. Gibbard, Ph.D. (U. Mich.), *Assistant to the Provost for Instruction.*

Multidisciplinary Studies (MDS) courses are those which: (a) analyze significant issues, problems, or themes by applying two or more disciplines to them; or (b) explore the theoretical and methodological relationship of two or more disciplines to each other; (c) involve a combination of disciplines such as to preclude their being classified realistically as one of humanities, social science, or physical science.

Responsibility for approving MDS courses rests with the Core Curriculum Subcommittee and the University Senate. Each course has its own staff, drawn from the faculties of the schools and colleges of the University.

The MDS courses listed here may be credited to Core, as indicated.

MDS

80. *Special Topics.* I, II. 1-3 hr.

90. *Man and Food.* I, II. 3 hr. Exploration on a global basis of interactions of man and environment as reflected in food production systems. Relation of food supply and use to development or maintenance of social and political institutions. May be credited to Core Group A or B or C.

91. *Introduction to Technology and Society I.* I. 3 hr. A team-taught introduction to technology (its nature and goals) and society (its nature and goals) in Victorian era. May be credited to Core Group A or B or C.

92. *Introduction to Technology and Society II.* II. 3 hr. PR: MDS 91. Continuation of MDS 91. May be credited to Core Group A or B or C.

101. *The Nature of Evidence.* I, II. 3 hr. Various professionals explore how problems are solved and conclusions reached in the arts and the sciences. While learning to base beliefs on evidence, the student will explore various methods for evaluating the bases of knowledge claims and decisionmaking. May be credited to Core Group A or B or C.

School of Nursing

The nation's increasingly complex health care problems require nurses capable of humane concern and support for patients and their families, as well as nurses who are able to exercise fully their specific responsibilities in maintaining and restoring health.

These abilities are most likely to be found in the nurse who has studied the humanities, social sciences, and natural sciences, in addition to the health, nursing, and medical sciences.

When the WVU School of Nursing was founded in 1960, the curriculum broke away from traditional nursing education patterns to introduce an experiment in integrated, progressive learning. Known throughout the country as The West Virginia Plan and since adopted in essence by other schools, the curriculum has proved it was soundly conceived.

Besides general education courses, the program offers each clinical nursing subject at increasing depth in each of the undergraduate clinical years—sophomore through senior. This provides meaningful repetition and reinforcement, without monotonous duplication, and allows students at the three levels to learn in a variety of clinical settings.

The curriculum also instills attitudes that help make for a logical transition to graduate study or to employment upon completion of the program.

The School of Nursing is accredited by the National League for Nursing.

Faculty

Lydia Aston, R.N., M.P.H. (U. Pitt.), *Adjunct Associate Professor of Nursing.*

Shirley Bell, R.N., M.S. (Wayne St. U.), *Associate Professor and Chairperson of Junior Level Nursing.*

Barbara Biehler, R.N., M.S. (U. Wisc.), *Assistant Professor of Maternal-Child Nursing.*

Mary Frances Borgman, R.N., M.Ed. (Duquesne U.), *Assistant Professor of Medical-Surgical Nursing.*

Sally Bryan, R.N., M.S. (U. Pitt.), *Instructor in Psychiatric Nursing.*

Marcia P. Roesch Colvin, R.N., M.A. (WVU), *Instructor in Psychiatric Nursing.*

Patricia Diehl, R.N., B.S. (St. U. Iowa), *Assistant Professor and Chairperson of Sophomore Level Nursing.*

Norma Dobson, R.N., M.S. (U. Wisc.), *Assistant Professor of Pediatric Nursing.*

Magery Drake, R.N., M.S.N. (Cath. U. Am.), *Associate Professor of Community Nursing.*

Okey B. Fawley, Jr., M.S.W. (WVU), *Instructor (part-time) in Psychiatric Nursing.*

Imogene P. Foster, M.S. (WVU), *Instructor in Public Health Nursing.*

Anne Gagnon, R.N., M.P.H. (U. Pitt.), *Instructor in Public Health Nursing.*

Doris Gosnell, R.N., M.Litt. (U. Pitt.), *Assistant Professor and Assistant Director of Continuing Education.*

Virginia P. Hagemann, R.N., A.M. (U. Chicago), *Professor of Pediatric Nursing.*

Sarah Hess, B.S. (WVU), *Teaching Assistant in Nursing.*

Kathleen O. Heverley, M.S. (Boston U.), *Instructor (part-time) in Maternal-Child-Nursing.*

Jean Hoff, R.N., M.P.H. (U. Pitt.), *Associate Professor and Chairperson of Senior Level Nursing.*

Joan Howard, R.N., M.S.N. (U. Penn.), *Instructor (part-time) in Community Health Nursing.*

Nancy A. Jackson, R.N., M.S.N.Ed. (U. Pitt.), *Assistant Professor of Public Health Nursing.*

Lorita Duffield Jenab, R.N., Ed.D. (Columbia U.), *Dean and Professor of Nursing.*

Judith Hightower Kandzari, R.N., B.S.N. (WVU), *Teaching Assistant (part-time) in Public Health Nursing.*

Sylvia Kelly, R.N., M.P.H. (U. Okla.), *Clinical Assistant Professor.*

Sandra Koon, R.N., B.S.N. (WVU), *Teaching Assistant in Nursing.*

Nancy Koontz, R.N., M.S. (U. Md.), *Assistant Professor of Medical-Surgical Nursing.*

Barbara Limandri, R.N., M.S.N. (Cath. U. Am.), *Instructor in Psychiatric Nursing.*

Clara Long, R.N., M.S. (Case West. Res. U.), *Associate Professor of Medical-Surgical Nursing.*

Sandra McFarland, R.N., B.S.N. (Duke U.), *Teaching Assistant in Nursing.*

Gaynelle McKinney, R.N., M.S.N.Ed. (Ind. U.), *Assistant Dean and Professor of Medical-Surgical Nursing.*

Margaret Boyle Marcinek, R.N., M.S. (U. Md.), *Instructor in Medical-Surgical Nursing.*

Annette W. Massey, R.N., M.S.N. (Yale U.), *Associate Professor of Psychiatric Nursing.*

Sue Mullennex, R.N., B.S.N. (WVU), *Teaching Assistant in Nursing.*

Barbara S. Nelson, R.N., M.S. (U. Pitt.), *Instructor in Maternal-Child Nursing.*

Elizabeth O'Connell, R.N., M.S.N. (Yale U.), *Professor of Maternal-Child Nursing.*

Lois E. O'Kelley, R.N., M.S.N. (Wayne St. U.), *Associate Professor of Medical-Surgical Nursing.*

C. Lynn Ostrow, R.N., M.S. (U. Cal.), *Instructor in Medical-Surgical Nursing.*

Virginia Robards, R.N., B.S.N. (St. Louis U.), *Instructor in Medical-Surgical Nursing.*

Anne Doyle Rockenstein, R.N., M.S. (Cath. U. Am.), *Assistant Professor of Medical-Surgical Nursing.*

Nancy Lee Schnell, R.N., M.S. (Cath. U. Am.), *Assistant Professor of Maternal-Child Nursing.*

Barbara Shaw, R.N., M.S.N. (U. Penn.), *Instructor in Community Health Nursing.*

Jane Shrewsbury, R.N., M.N.Ed. (U. Pitt.) *Instructor in Pediatric Nursing.*

Gearlean Swentzel Slack, R.N., M.Litt. (U. Pitt.), *Director of Continuing Education and Professor of Nursing.*

Natalie Stafford, R.N., M.S. (U. Pitt.), *Assistant Professor of Obstetrical Nursing.*

Fredona Eames Stenger, R.N., M.S.N. (Boston U.), *Associate Professor of Pediatric Nursing.*

Rowena B. Thompson, R.N., M.S. (WVU), *Instructor in Psychiatric Nursing.*

Tish Thornley, R.N., B.S.N. (WVU), *Teaching Assistant in Maternal-Child Nursing.*

Barbara Bender Weller, R.N., M.S.N. (Yale U.), *Associate Professor of Maternal-Child Nursing.*

Audrey E. Windemuth, R.N., M.N.A. (U. Minn.), *Director of Nursing Service; Associate Director of University Hospital; Clinical Associate Professor.*

Admission

University application forms may be obtained from your high school principal or from the Dean of Admissions and Records, West Virginia University, Morgantown, WV 26506. Initial application should be submitted to the Office of Admissions and Records.

Application should be made in the fall of the senior year in high school. All students entering as first-semester freshmen are required to take the American College Testing Program (ACT) tests and should have the report of scores sent to the WVU Admissions and Records Office. Students intending to pursue a career in nursing should select high school courses in sciences, languages, and social sciences, in addition to the University requirements of four units of English and one of algebra.

Students are enrolled in the Pre-Nursing program in the College of Arts and Sciences for the freshman year. Contact with the school of Nursing is insured during this year through two required nursing courses and nurse-faculty advisors for pre-nursing students.

To qualify for admission to the School of Nursing *a candidate must have completed one year of prescribed courses in an accredited college or university;* the program within the School of Nursing then consists of one summer session and three academic years.

Application for admission to the School of Nursing should be made on or about January 1 of the college freshman year. Application forms are available upon request from the Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506.

A candidate for nursing should have good physical and mental health. The School of Nursing through its Admissions Committee admits students who, by reason of personal and intellectual qualities, show promise of benefiting from the program and of contributing to the field of nursing. Factors influencing decisions of the Admissions Committee are: academic record, motivation for academic nursing, health, personal qualities, and social adjustment. A dominant factor in admission is the availability of spaces in the class. Applicants who, in the judgment of the Admissions Committee, present the highest overall qualifications are selected for admission to nursing. Upon acceptance, a $50.00 tuition deposit is required. This sum is applied to first semester tuition.

A student is eligible for admission by presenting a grade-point average of 2.5, or better, based on all work attempted. Interviews will be arranged only for students who present a 2.5 average. Students whose GPA falls between 2.3 and 2.5 may petition in writing to the Admissions Committee for special consideration. Such a petition should clearly state the reason why the applicant should receive special consideration.

Transfer Students

A student from an accredited college or university is eligible for admission by presenting a record of courses comparable to those required in this curriculum, except for courses in Orientation to Nursing. Because of the design of this curriculum, a transfer student must complete a minimum of three years and a summer session in the School of Nursing, regardless of previous college credit.

Application for transfer should be initiated by January 1 in order to allow time for evaluation and processing of credentials.

Curriculum

The curriculum, which has come to be known nationally as The West Virginia Plan, stresses the unity of nursing. It is designed to provide learning experiences of increasing depth, moving from the simple to the complex in all phases of clinical nursing as the student progresses through the course of study. All upper-division courses in the nursing major are built upon prerequisites at the lower-division level. For example, the student studies maternity nursing as a sophomore, again as a junior, and again as a senior. The same is true in each clinical nursing object. This plan enables the learner to return to each clinical field after adding to knowledge in other fields of nursing and in general education courses.

Academic Standards

In order to qualify for unconditional promotion each year, a student must meet the following requirements:

1. Maintain a cumulative grade-point average of 2.0 (C) or better in all work attempted.
2. Maintain an annual grade-point average of 2.0 or better in nursing courses.
3. Maintain an annual grade-point average of 2.0 or better in clinical nursing courses at the upper level.
4. Pass all required courses.
5. Maintain physical and emotional health suitable for continuance in nursing.

Conditional promotion may be granted if a student fails to meet the requirements listed above, and presents an acceptable plan for meeting the requirements within a time limit acceptable to the Promotions Committee. The conditions must be removed within the following semester or within the time prescribed by the committee.

Graduation Requirements

All students are required to take the National League for Nursing (NLN) achievement examinations in the respective areas at the completion of their senior level experience in: Obstetric Nursing, Nursing of Children, Medical-Surgical Nursing, Psychiatric Nursing, and Public Health Nursing. The student pays $7.00-$9.00 for the entire series during the senior year.

The Bachelor of Science degree in Nursing (B.S.N.) is conferred upon completion of curriculum requirements. The School of Nursing requires a cumulative grade-point average of 2.0 (C) in all work, a cumulative grade-point average of 2.0 in all nursing courses, and a cumulative grade-point average of 2.0 in upper-division clinical nursing courses.

Registered Nurse Students

The School of Nursing offers graduates of diploma and associate in arts degree schools of nursing opportunity to complete requirements for the B.S.N. Liberal arts credit earned in any accredited college or university may be counted toward fulfillment of degree requirements if course work is comparable to that required in this curriculum. Nursing course requirements must be fulfilled as prescribed by the School of Nursing.

The application must be submitted to Dean of Admissions and Records, West Virginia University, Morgantown, WV 26506, if the applicant presents less than 35 semester hours of valid, transferable college credit.

The registered nurse student who has established the following 35-38 credits earned at WVU, by transfer from an accredited college or university or by advanced standing examination, is eligible for the comprehensive Advanced Standing Examination covering content objectives in all the sophomore-level nursing courses (courses numbered 16 through 70), totaling 18 credit hours: Chem. 11 and 12 (8 hr.); Psych. 1 (3 hr.); S.A. 1 (3 hr.), English 1 and 2 (6 hr.); Anat. (3-4 hr.); Physiol. (3-4 hr.); Microbiol. (3-4 hr.); Pharmacol. (3 hr.); and Nutrition (3 hr.).

Application to the School of Nursing is submitted to the Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, during the semester in which the applicant plans to take the Comprehensive Advanced Standing Examination. The applicant who achieves 18 credit hours on the basis of this examination makes application to the School of Nursing as a junior.

The applicant who is unsuccessful on the first attempt on the Comprehensive Advanced Standing examination and wishes to enroll in the School of Nursing makes application to the Admissions Committee as a sophomore nursing student.

Registered nurse students are entitled to all rights and privileges in the School of Nursing. Nurses must wear the official school uniform while on clinical assignments.

Registered nurse students are eligible for graduation upon completion of degree requirements in effect at the time of their first registration in the school, provided they apply for graduation within seven years of that date. A student failing to complete requirements by the expiration date may then be held to any new requirements in effect in the school.

Transportation

Each student is responsible for providing her own transportation for community nursing experiences. This means that she should have the use of an automobile for the junior and senior years.

Sample Curriculum Plan — Basic Students

First Year	Hr.	Second Year	Hr.
Core Group A	3	Pcol. 160[c]	3
Chem. 11, 12[c]	8	Anat. 101[c]	3-4
English 1, 2	6	Physiol. 101[c]	3-4
P.E. 3 & Gen. Prgrm.	2	Micro. or Bact.[c]	3-4
Psych. 1 & Sociol. 1[b]	6	Nsg. 16	4
Core A or Elective	6	Nsg. 17	1
Nsg. 3	1	Nsg. 19	5
Nsg. 4	1	Nsg. 20	3
		Nsg. 34	3
		Nsg. 70	2
		Nutrition 71[c]	3

Summer Between Second and Third Year

	Hr.
Nsg. 110	6

Either Third or Fourth Year

	Hr.
Core A	3
Core B	6
(3 hr. Psych. or Sociol.)	
Electives or Core A	6

Third Year

	Hr.
Nsg. 120	5
Nsg. 130	3
Nsg. 140	2
Nsg. 150	4
Nsg. 160	3
Nsg. 170	2
Mgmt. 216	3

Fourth Year

	Hr.
Nsg. 201	3
Nsg. 211	2
Nsg. 220	4
Nsg. 230	2
Nsg. 240	2
Nsg. 250	2
Nsg. 260	2
Nsg. 271	3

[b,c]Contributes to Core Group B, C, respectively.

Courses of Instruction in Nursing

3. *Orientation to Nursing* I. 1 hr. Introduction to philosophy and responsibilities of professional nursing and role of the professional nurse.

4. *Orientation to Nursing.* II. 1 hr. Continuation of Nsg. 3.

16. *Life Process.* I. 4 hr. PR: Psych. 1, Sociol. 1 and/or consent. The physical and psychosocial development of the individual within a nuclear family. Emphasis on: (1) interaction of individuals at various stages of development within the family milieu, and (2) family developmental tasks. Consideration given to the single adult. Observation of individuals at different ages is arranged.

17. *Family Study Practicum.* Yr. Course. 1 hr. PR: Consent. An opportunity to apply the concepts of "family" from Nsg. 16 and "health guidance" from Nsg. 19 to a selected well-family. Structured conferences correlated with scheduled family visits.

19. *Dynamics of Nursing.* I. 5 hr. An interdepartmental course introducing professional nursing as an art and science. Deals with the commonalities of nursing basic to promotion and maintenance of health and provision of care to all age groups in various settings. Emphasis on nursing role, basic human needs, and interpersonal relations. Includes introductory clinical nursing experiences.

20. *Nursing of the Adult in Health and Illness.* II. 3 hr. PR: Nsg. 11, 12. Deals with physiological changes necessitating, and the nursing problems resulting from, surgical intervention and long-term immobilization with an introduction to disease pathogenesis. Clinical laboratory experiences provide an opportunity to explore problems and initiate nursing action for the hospitalized adult patient with emphasis on maintaining or restoring maximum health with functional independence. Methods of maintaining continuity of care are explored and mental health and family concepts are continued concurrently.

34. *Maternal-Child Health Nursing.* II. 3 hr. PR: Nsg. 16, 17, 19. Nursing care of children and of women during the normal maternity cycle with emphasis on the factors which predispose to congenital and hereditary defects, which respond to early restorative and preventive measures for promoting optimal functioning and reduc-

ing the development of serious childhood illnesses. Mental health and family health concepts are integrated. Clinical laboratory experiences.

70. *The Nurse in Western Culture.* II. 2 hr. Evolution of modern nursing with emphasis on ethical and legal problems confronting the nurse.

110. *Basic Concepts of Disease.* S. 6 hr. PR: Nsg. 20, Nsg. 34 or consent. Facilitates the transition from generalities of the sophomore curriculum to the specifics of junior curriculum in relation to interaction of man's psychological, physical, social, and spiritual self. Instruction, experiences, and skill development in classroom and hospital setting.

120. *Nursing of the Physically Ill Adult.* I, II. 5 hr. PR: Nsg. 110. Major adult health problems arising from pathophysiologic adaptation to illness and nursing care of the hospitalized adult. Clinical experience emphasizes nursing care as necessitated by specific adaptive responses and the therapeutic management. (Taught conjointly with Nsg. 130.)

130. *Nursing of Children.* I, II. 3 hr. PR: Nsg. 110. Pathophysiologic adaptation of children to illness and of nursing care of the hospitalized infant and child. Clinical experience emphasizes nursing care of children as necessitated by specific responses and therapeutic management. (Taught conjointly with Nsg. 120.)

140. *Maternity Nursing.* I, II, S. 2 hr. PR: Nsg. 110. Concepts, principles, and clinical experience in maternity nursing. Providing basic support for the mother during labor and delivery and immediate care of newborn. Emphasis on the family as a unit and on the reproduction process as it affects personal and family life.

150. *Psychiatric Nursing.* I, II. 4 hr. PR: Nsg. 110. Dynamics of human behavior as relates to psychopathology and nurse-patient relationship. Clinical experience in observing the continuum of human behavior and assessing relationships between self and others.

160. *Community Nursing.* I, II, S. 3 hr. PR: Nsg. 110. Community health problems with special reference to prevention and control. Emphasis on nursing care of families with health problems and on means by which communities organize for better health. Instruction, experience, and observation in community health facilities.

170. *Introduction to Research in Nursing.* I, II. 2 hr. PR: Junior standing or consent. Special reference to utilization of research in improvement of patient care. Considers the theory of nursing and use of scientific criteria in evaluation of current nursing research.

201. *Leadership in Nursing Practice.* Yr. Course. 3 hr. PR: Mgmt. 216 or equiv. Focuses on assumed and ascribed leadership roles, responsibilities and processes involved in setting and achieving patient and family nursing goals using a variety of personnel. Assessment; planning; collaboration; staff assigning, directing and evaluating is examined in theory and practice. Clinical practicum consists of experience in management of a nursing team and experience in collaboration seminar.

211. *Principles of Community Health.* I, II. 2 hr. PR: Nsg. 120, 130, 140, 150, 160. Methods of studying community health problems and ways of organizing community health services.

220. *Nursing of the Physically Ill Adult.* I, II. 4 hr. PR: Nsg. 120, 130, 140, 150, 160. Nursing problems associated with degree, duration, and sequela of health change. Emphasizes developing nursing competencies with respect to nursing diagnosis and intervention. Clinical experiences are with acutely ill and chronically ill adult patients.

230. *Nursing of Children Seminar.* I, II. 2 hr. PR: Nsg. 120, 130, 140, 150, 160. Discussion and clinical experience concerned with continued nursing care required for the ill and handicapped child and supportive needs of the child's family. Emphasis on coordination of health care for children with major health problems.

240. *Maternity Nursing Seminar.* I, II. 2 hr. PR: Nsg. 120, 130, 140, 150, 160. Broadening and deepening of concepts, principles, and practices of maternity nursing. Empha-

sis on special problems and on nursing appraisal of patient's needs. Clinical experience with groups of maternity patients.

250. *Special Problems in Psychiatric Nursing.* I, II. 2 hr. PR: Nsg. 120, 130, 140, 150, 160. Theoretical and experiential approaches to the investigation of nursing roles and mental health problems in the community. Clinical experience in a community mental health center.

260. *Community Nursing.* I, II. 2 hr. PR: Nsg. 120, 130, 140, 150, 160. Community involvement and in-depth experience in community nursing with special reference to emerging patterns in community health care and the role of the nurse in assisting the community to meet its nursing needs. Clinical experiences are with selected families and in a variety of community agencies.

271. *Nursing in the Social Order.* II. 3 hr. Issues and trends in health care with particular emphasis on the role and responsibility of the individual practitioner and the profession of nursing in the provision of services; examination of underlying ideas, attitudes, values and beliefs through faculty-student forums, seminars, and debates.

School of Physical Education

The School of Physical Education studies the role of sport, dance, and safety. University students and others are offered opportunities for developing knowledge, attitudes, and skills related to sport, dance, and safety activities, issues, and problems.

Students enrolled in General Physical Education Program classes have an opportunity to develop knowledge, attitudes, and skills through participation in a variety of sport, dance, and physical activities.

Professional students (Physical Education majors) study the relationship of sport, dance, and physical activity to our culture and cultures throughout the world. A large percentage of physical education graduates are employed as school teachers. Their preparation in physical education is designed to acquaint them with the physiological, psychological, and sociological needs of school children as they relate to participation in sport, dance, and physical activity. Other graduates are employed in areas requiring a background in sport, such as boys and girls clubs, YMCAs and YWCAs, private athletic clubs, community and industrial recreation projects, mental and penal institutions, sport writing, sport broadcasting, sport equipment production and marketing, Red Cross, scouts, and private and public camps. Their preparation includes interdisciplinary studies in areas such as business and economics, journalism, physiology, psychology, and sociology and anthropology.

Baccalaureate degree tracts offered in the School of Physical Education are: (1) teacher certification in physical education and a second teaching field chosen from many curricula, (2) teacher certification in physical education, health, and safety, and (3) interdisciplinary emphasis programs selected from sport management, sport marketing, sport writing, sport broadcasting, sport physiology, and sport social psychology.

In addition to the baccalaureate degree programs, the School of Physical Education offers undergraduate preparation leading to certification in the field of safety studies.

Degrees at both the master's and doctoral levels are offered in physical education and safety studies. These programs are designed to permit the formulation, systematic analyzation, and dissemination of concepts through research, application, and scholarly effort in the study of sport, dance, and safety.

Facilities

Facilities of the School of Physical Education include the gymnasium, dance studio, and swimming pool in Moore Hall; gymnasiums in Stansbury Hall; swimming pool in Old Mountainlair; bowling lanes in Mountainlair; outdoor areas including the golf course, stadium, tennis courts, archery range, and soccer and field hockey fields.

The Coliseum contains the Ray O. Duncan Memorial Library, classrooms and seminar rooms, one large gymnasium, a large room for dance activities and low organizational games, handball and squash courts, adapted physical education and weight training room, safety studies laboratory, research laboratory, and offices for the faculty (some faculty and staff are housed in Moore Hall, Stansbury Hall, and Old Mountainlair).

Intramural Sports

A broad intramural sports program for men and women, which is provided in cooperation with Student Educational Services, encourages students to voluntarily participate in organized sports and recreation.

Faculty

C. Peter Yost, Ph.D. (U. Pitt.), *Dean & Professor, School of Physical Education.*
William L. Alsop, Ed.D. (WVU), *Assistant Professor of Physical Education.*
Judith H. Bailie, B.S. (Mills C.), *Instructor (part-time) in Physical Education.*
Kittie Jean Blakemore, M.S. (WVU), *Associate Professor of Physical Education and Women's Basketball Coach*
William A. Bonsall, M.S. (WVU), *Associate Professor of Physical Education and Gymnastics Coach.*
Robert C. Bowden, M.S. (Geo. Peabody C.), *Instructor in Physical Education and Head Football Coach.*
Marilyn Kay Bowers, M.S. (Ind. St. U.), *Instructor in Physical Education.*
Jerry L. Bruner, B.S. (Fla. St. U.), *Instructor in Physical Education and Assistant Football Coach.*
Leland E. Byrd, Ed.D. (WVU), *Professor of Physical Education and Director of Intercollegiate Athletics.*
Wincie Ann Carruth, Ph.D. (NYU), *Professor Emeritus of Physical Education*
Frank J. Cignetti, M.Ed. (Ind. St. U., Pa.), *Instructor in Physical Education and Assistant Football Coach.*
E. Eugene Corum, M.S. (WVU), *Associate Professor of Physical Education.*
J. William Douglas, Ph.D. (Ohio St. U.), *Associate Professor of Physical Education and Chairperson of Professional Physical Education.*
Patricia K. Fehl, Ed.D. (Ind. U.), *Professor of Physical Education and Chairperson, General Physical Education.*
Alex Gibbs, M.A. (U. N. Car.), *Instructor in Physical Education and Assistant Football Coach.*
Kevin Gilson, M.A. (WVU), *Instructor in Physical Education and Swimming Coach.*
Albert C. Gwynne, M.S. (WVU), *Assistant Professor of Physical Education and Trainer.*
Stephen Harrick, M.A. (WVU), *Associate Professor Emeritus of Physical Education.*
George Henshaw, M.S. (WVU), *Instructor in Physical Education and Assistant Football Coach.*
Beatrice Hurst, M.A. (Columbia U.), *Associate Professor Emeritus of Physical Education.*
Charles L. Klausing, M.Ed. (U. Pitt.), *Instructor in Physical Education and Assistant Football Coach.*
Robert L. Kurucz, Ph.D. (Ohio St. U.), *Associate Professor of Physical Education and Chairperson, Graduate Studies Advisory Committee.*
Craig Lewellen, B.S. (Iowa St. U.), *Instructor in Physical Education and Athletic Trainer.*
Thomas Martin, B.A. (Davis & Elkins C.), *Instructor (part-time) in Physical Education.*

John C. McGrath, M.S. (Bemidji St. C.), *Instructor in Physical Education and Soccer Coach.*
C. Everett Marcum, H.S.D. (Ind. U.), *Professor and Chairperson, Department of Safety Studies.*
Richard A. Metcalf, Ed.D. (WVU), *Assistant Professor of Physical Education.*
George Nedeff, M.S. (WVU), *Instructor in Physical Education and Wrestling Coach.*
Gerald Oakley, M.S. (Ind. St. U.), *Instructor in Safety Studies.*
Andrew C. Ostrow, Ph.D. (U. Calif.), *Assistant Professor of Physical Education.*
Mary Jane Pearse, M.S. (WVU), *Assistant Professor of Physical Education.*
Joseph Pendry, B.S. (WVU), *Instructor in Physical Education and Assistant Football Coach.*
Dale Ramsburg, M.S. (WVU), *Instructor in Physical Education and Baseball Coach.*
Stanley E. Romanoski, M.S. (WVU), *Instructor in Physical Education and Coach of Track Athletics.*
Nanette Schnaible, M.S. (N.Y. St. C. — Brockport), *Instructor in Physical Education and Women's Gymnastic Coach.*
John Semon, M.S. (WVU), *Assistant to the Dean and Associate Professor of Physical Education.*
Pete Shaffron, Jr., M.S. (WVU), *Instructor in Safety Studies.*
Susan Sherman, *Instructor (part-time) in Physical Education.*
J. Edward Shockey, B.S. (King C.), *Instructor in Physical Education and Assistant to Athletic Director.*
David H. Taylor, M.S. (WVU), *Instructor in Physical Education.*
Martha Thorn, M.S. (WVU), *Instructor in Physical Education and Women's Tennis Coach.*
Patrick A. Tork, M.S. (WVU), *Professor Emeritus of Physical Education.*
Charity W. White, M.S. (WVU), *Associate Professor of Physical Education.*
Mary Katherine Wiedebusch, B.S. (WVU), *Assistant Professor of Physical Education.*
Bruce W. Wilmoth, M.S. (Brigham Young U.), *Assistant Professor of Physical Education.*
L. Donald Young, M.S. (WVU), *Instructor in Physical Education and Assistant Football Coach.*
James Youngblood, B.A. (Fairmont St. C.), *Instructor in Physical Education and Assistant Football Coach.*
Daniel H. Ziatz, Ph.D. (U. Utah), *Assistant Professor of Physical Education.*

Admission

For admission to the School of Physical Education, prospective students must be qualified for admission to West Virginia University and possess a grade-point average of 2.0.

Students may be considered for admission to WVU on the basis of graduation and transcripts from accredited high schools. High school graduates are required to present credit for 4 units of English and 1 unit of algebra.

All students entering as first-term freshmen are required to take the American College Testing Program tests (ACT) and have the report of scores sent to

the University. This test is not used for admission, but for placement, and no other test may be substituted for it.

Students from West Virginia high schools should obtain applications for admission from their high schools. Out-of-state students may write the WVU Office of Admissions and Records and request an application form. Applicants should prepare their part of the application and then return it to their secondary school. The school will then send the completed application and a transcript of high school grades directly to Office of Admissions and Records.

Students interested in financial assistance must file a Parents Confidential Statement. Forms are available at your high school or from the Financial Aids Office, WVU. Submit only forms dated for the current academic year.

Complete information concerning WVU admission, registration, fees and expenses, regulations, etc. may be obtained in Part 2 of this Catalog.

Requirements for Physical Education Degrees

The degree of Bachelor of Science in Physical Education may be conferred upon any student who: (1) meets the requirements of the Professional Physical Education Program, (2) offers a minimum of 128 hours, and (3) has a cumulative grade-point average of 2.0.

Professional Physical Education: Required Subjects

Of the 128 hours required for the Bachelor of Science in Physical Education, a minimum number of hours are required in the School of Physical Education. This number is contingent upon the program a student pursues.

Teacher Certification Program in Physical Education

The required courses for teacher certification in Physical Education are:

1. Theory and Foundations — P.E. 71, 72, 74, 121, 125, 130, 131, 154, 164, 165, 177, 191, 192.
2. Sport and Movement Analysis
   - Area 1: One course selected from P.E. 51, 61, 62
   - Area 2: One course selected from P.E. 52, 58, 124
   - Area 3: One course selected from P.E. 54, 64
   - Area 4: Men — Dance 39
   - Area 4: Women — Dance 39 and Dance 35 or 37
   - Area 5: Men — Two courses selected from P.E. 53, 55, 56
   - Area 5: Women — One course selected from P.E. 31, 32, 63
3. Second Teaching Field and Professional Education — See requirements as listed in the College of Human Resources and Education.

Teacher Certification Program in Physical Education, Health, and Safety (Comprehensive)

The required courses for teacher certification in Physical Education, Health, and Safety are:

1. *Physical Education*
   a. Theory and Foundations — P.E. 71, 72, 74, 121, 125, 130, 164, 165, 177, 191, 192
   b. Sport and Movement Analysis — The requirements are the same as those for Teacher Certification Program in Physical Education. (See preceding program.)

2. *Health Education* — H.E. 50, 70, 71, 104, C & I 280
3. *Safety Studies* — Saf. S. 70, 131, 231, 251, 254
4. *Professional Education* — See requirements in the College of Human Resources and Education.

Interdisciplinary Emphasis Program

The required courses for the non-teacher certification, interdisciplinary emphasis program, are:

1. *Physical Education*
   a. Theory and Foundations — P.E. 71, 72, 74, 121, 154, 164, 165, 177, 192, 199
   b. Sport and Movement Analysis — The requirements are the same as those for teacher certification in Physical Education.
2. *Second Field* — A second field is to be selected from one of the following areas. The course requirements for each area are listed.
   a. Business and Economics — Acctg. 51 and 52, Econ. 51 and 52, Bus. Law 111, Mgmt. 111, Mktg. 111, Finan. 111, Electives — Six hours chosen from any of the following: Accounting, Business Law, Economics, Finance, Management, and Marketing.
   b. Sport Broadcasting — Journ. 18, 19, 182, 183, 189, 228, 284, 285
   c. Sport Reporting (Newspaper) — Journ. 18, 19, 111, 118, 120, 141, 220, 228
   d. Social Psychology — S.A. 1, 5, Psych. 1, 2, Electives — Twelve hours chosen from Sociology/Anthropology and Psychology. At least one course must be chosen from each area.
   e. Physiology — Chem. 15, 16, Math. 3, 4, Physics 1, 2, Biol. 266

General Education

The General Education requirements are the same for all undergraduate programs in the School of Physical Education. These requirements satisfy the WVU Core Curriculum requirements. They are:

English 1, 2; English 35 or 135 and 36 or 136; Speech Com. 11; Speech Com, 12, 13, or 14 (choose one); (Drama 50 may replace Speech Com. 11 and one course chosen from Speech Com. 12, 13, or 14); Hist. 1, 2, or 3 (choose two); Soc. Sci. 1, 2; Art 30; Music 30; Biol. 1, 2; Math. 21, 22. Advanced ROTC cannot be counted in total hours toward graduation.

Recommendation for Teacher Certification

The prospective teacher who intends to apply for teacher certification in West Virginia must satisfy the requirements (1) in physical education, professional education, and a second teaching field, or(2) in a comprehensive teacher certification program in Physical Education, Health, and Safety and professional education.

Teacher certification in physical education is provided for grades K-12 or 7-12. The second teaching field must be chosen from the many and varied teaching specialization programs for elementary and secondary school teachers listed in the College of Human Resources and Education, Division of Education.

All students must meet the certification requirements that are in effect at their first registration in the teacher preparation program.

For teacher certification, students shall be responsible for every registration in a course. The grade-point average shall be computed on all work attempted.

Student Petitions

1. Petitions must be submitted to the Committee on Academic Standards:
   a. To register for more than maximum hours regularly allowed
   b. To register for less than minimum load
   c. For reentry after academic suspension
   d. To withdraw from courses whenever withdrawal reduces the student's credit hours load below the required minimum
   e. To withdraw from a course when a student is on academic probation
   f. To withdraw from a course after the W-WU period is in effect.
2. Petitions should be prepared on special forms and must include the recommendation of the student's adviser.
3. Students may appear in person before the Committee on Academic Standards to support their petitions.
4. Students may appeal decisions of their advisers and the Committee on Academic Standards to the Dean.
5. Students should submit petitions at an early date. Delay may result in denial.

General Program for Men and Women

The aims of the General Physical Education Program are to develop:

1. An appreciation of the body and its capacity to move.
2. Movement skills within the concept of games, sport, dance and aquatics.
3. An appreciation of the value of continued activity throughout all age periods in an individual's life.
4. An understanding of the cultural significance of sport and dance.
5. Concepts of the physiological characteristics of sport and movement. WVU's physical education requirements should be met in the first year of residence. Two hours of general program are required. WVU Health Service Operations will determine whether students are physically qualified to participate in the required physical education program. An individually adapted program, based on the recommendations of the health service, is offered for students who are unable to participate in the regular required program because of physical handicaps.

Courses of Instruction

General Physical Education Program

The General Physical Education Program is a two-semester WVU requirement except for physical education majors and transfer students with 58 or more hours. Elementary education majors substitute P.E. 41 and 42 in meeting the two-semester requirement.

The program permits selection of various sport, dance, aquatics, and physical activities. Repeating an activity is not allowed except at an advanced level.

The activities for courses numbered P.E. 1 through 25, P.E. 41 and 42, and Dance 5 through 18 are as follows:

Physical Education

P.E.

1, 2. *General Program.* I, II. 1 hr. (Selected sections of P.E. 1 and 2 open to men and women.) Students select from the following: Adapted Physical Education; Archery; Aquatics: (Advanced Swimming, Beginning Swimming, Diving, Lifesaving, Synchronized Swimming); Backpacking; Badminton; Bowling, Conditioning; Cycling; Dance: (Ballet, Ballroom, Folk, Jazz, Modern); Fencing; Golf; Gymnastics; Handball; Horseback Riding; Judo; Karate; Outdoor Sports; Racquet Ball; Riflery; Self-Defense, Skiing; Slimnastics; Squash; Table Tennis; Tennis; Volleyball; Weight Training; and Yoga. ($10.00 course fee for each P.E. 1 and P.E. 2.)

3. *Fundamentals of Physical Education.* I. 1 hr. (W). Physical self-image, principles of movement, movement patterns in sports and daily living. ($10.00 course fee.)

4. *Golf and Bowling.* I, II. 1 hr. ($10.00 course fee.)

7. *Archery.* I, II. 1 hr. ($10.00 course fee.)

8. *Recreational Sports.* I, II. 1 hr. (W). Badminton, table tennis, deck tennis, and shuffleboard. ($10.00 course fee.)

9. *Team Sports.* I. 1 hr. Volleyball and hockey. ($10.00 course fee.)

10. *Team Sports.* II. 1 hr. Basketball and softball. ($10.00 course fee.)

13. *Tennis and Bowling.* I, II. 1 hr. ($10.00 course fee.)

14. *Elementary Swimming and Diving.* I, II, 1 hr. ($10.00 course fee.)

15. *Intermediate Swimming and Diving.* I, II. 1 hr. ($10.00 course fee.)

16. *Lifesaving and Water Safety.* II. 1 hr. (Opportunity to qualify for American Red Cross Senior Lifesaving Certificate.) ($10.00 course fee.)

21. *Physical Fitness.* I, II. 1 hr. ($10.00 course fee.)

25. *Fencing.* I, II. 1 hr. ($10.00 course fee.)

41. *Physical Education for Elementary Teachers.* I, 1 hr. ($10.00 course fee.)

42. *Physical Education for Elementary Teachers.* II. 1 hr. ($10.00 course fee.)

Dance

5. *Ballroom Dance.* I, II. 1 hr. ($10.00 course fee.)

11. *Folk Dance.* I, II. 1 hr. ($10.00 course fee.)

17. *Elementary Modern Dance.* I, II. 1 hr. ($10.00 course fee.)

18. *Advanced Modern Dance.* I, II. 1 hr. ($10.00 course fee.)

Professional Preparation Courses

Dance

35. *Theory and Practice of Modern Dance Techniques.* I, II. 2 hr. Modern dance techniques and rhythmic analysis of movement patterns. ($10.00 course fee.)

37. *Advanced Dance Techniques with Principles of Choreography.* II. 2 hr. PR: Dance 35. Concentrated study in creative movement problems. ($10.00 course fee.)

38. *Dance Composition.* II. 2 hr. PR: Dance 35, 37. Problems in force, time, and space as elements of expressive movement. ($10.00 course fee.)

39. *Folk and Ballroom Dance.* I, II. 2 hr. Folk, square, and ballroom dance forms. ($10.00 course fee.)

171. *Basic Rhythms and Dance Accompaniment.* II. 2 hr. PR: One semester of modern dance. Basic principles of rhythm as they relate to body movement. (Ability to play the piano not required.) ($10.00 course fee.)

Physical Education

31. *Soccer and Track and Field.* I. 2 hr. (W). ($10.00 course fee.)

32. *Basketball and Softball.* II. 2 hr. (W). ($10.00 course fee.)

43. *Physical Education for Elementary Teachers.* I, II, S. 2 hr. PR: P.E. 41, 42, or consent. Philosophy, objectives, curriculum, and methods of teaching physical education activities for children K-8. Field experiences included. (Required for elementary school teaching certification.) ($10.00 course fee.)

51. *Gymnastics and Volleyball.* I. 2 hr. (M). ($10.00 course fee.)

52. *Aquatics.* I, II, S. 2 hr. PR: Intermediate swimming or equiv. Exposure to swimming, diving, skin and scuba diving, synchronized and competitive techniques, small craft, water safety and pool maintenance. ($10.00 course fee.)

53. *Soccer and Wrestling.* I. 2 hr. (M). ($10.00 course fee.)

54. *Badminton, Golf, Handball, and Tennis.* I, II, S. 2 hr. ($10.00 course fee.)

55. *Baseball and Basketball.* I. 2 hr. (M). ($10.00 course fee).

56. *Track and Field and Football.* I, II, S. 2 hr. (M). ($10.00 course fee).

58. *Synchronized Swimming.* I, II. 2 hr. PR: P.E. 52 or equiv. Non-competitive and competitive synchronized swimming. ($10.00 course fee.)

61. *Gymnastics.* I. 2 hr. (W). ($10.00 course fee.)

62. *Advanced Gymnastics.* II. 2 hr. PR: P.E. 51 (M); P.E. 61 (W), or equiv. Advanced skills and techniques in tumbling, regular and special apparatus work, and related areas of gymnastic instruction. ($10.00 course fee.)

63. *Field Hockey and Volleyball.* I. 2 hr. (W). ($10.00 course fee.)

64. *Archery, Bowling, and Fencing.* I, II. 2 hr. ($10.00 course fee.)

68. *Sport Officiating.* II. 1 hr. (W). PR: Consent. Rules, techniques, and laboratory work. ($10.00 course fee.)

71. *Sociological and Psychological Perspectives of Sport.* I, II, S. 3 hr. Sociological and psychological factors related to man's involvement in sport.

74. *Motor Learning.* I, II, S. 3 hr. PR: Ed. Psych. 105 or Psych. 1, or consent. Factors influencing motor skill acquisition and their relationship to performance in sport and physical activity.

121. *Sport Injury Control and Management.* I, II. 3 hr. PR: Four courses in Sport and Movement Analysis or consent. Training, conditioning, protection, and other injury prevention measures. First aid, emergency service, and after care related to physical education and athletics. ($10.00 course fee.)

124. *Water Safety Instructorship.* I, II. 2 hr. PR: Senior Lifesaving Certificate. Teaching methods in swimming and water safety. Meets American Red Cross certification standards. Course completion carries eligibility for teaching swimming, lifesaving, and water safety. ($10.00 course fee.)

125. *Movement Education for Children.* I, II. 3 hr. Movement education and its implication for teaching methodology in elementary school physical education. Laboratory work included. ($10.00 course fee.)

130. *Methods of Teaching Physical Education.* I, II. 3 hr. PR: Four courses in sport and movement analysis and Ed. Psych. 105 and 106. (Cross listed as C&I 174.) Communication skills involved in teaching Physical Education in the secondary schools. Emphasizes teaching techniques and methodology. Laboratory work included.

131. *Program Assisting.* I, II, S. 1 hr. PR: P.E. 130.

154. *Sport Coaching.* I, II, S. 3 hr. PR: Four courses in sport and movement analysis, or consent. Designed to prepare students for athletic coaching.

164. *Kinesiology.* I, II, S. 3 hr. PR: Junior standing. Anatomical, mechanical, and musculoskeletal study of the human body as the instrument for efficient performance of motor activities. Laboratory work included. ($10.00 course fee.)

165. *Physiology of Motor Activities.* I, II, S. 3 hr. PR: Junior standing. Human functions under stress of motor activity. Laboratory work included. ($10.00 course fee.)

176. *Adapted Program in Physical Education.* I, II, S. 2 hr. PR: P.E. 164 or consent. Organizing and adapting physical education programs to meet the needs of atypical students.

177. *Historical and Philosophical Perspectives of Sport.* I, II, S. 3 hr. PR: Junior standing. The historical antecedents and the philosophical bases of sport as related to society.

191. *Measurement and Evaluation in Physical Education.* I, II, S. 3 hr. PR: Junior standing. Measurement devices and evaluation techniques employed by physical educators. Criteria for test construction and selection, pertinent standardized tests, and the use of statistical models for evaluating test data.

192. *Organization and Administration of Physical Education.* I, II, S. 3 hr. PR: Junior standing. Analysis of administrative and organizational principles and processes relating to physical education. Cross listed as C&I 279.

198. *Special Topics.* I, II, S. 1-3 hr. PR: Consent of Department Chairperson and Dean. In-depth analysis of physical education subject-matter areas through an innovative course(s) or research or field experiences not included in the major curriculum but as an adjunct to the curriculum.

199. *Seminar in Physical Education.* I, II. 3 hr. PR: Junior standing. A study and discussion of problems and issues in physical education.

300. *Workshop in Physical Education.* I, II, S. 1-15 hr.

305. *Philosophical Concepts in Physical Education.* I, S. 3 hr. PR: Graduate standing or consent. Study of educational philosophies and application of these philosophies to physical education; study of the place of physical education in education and modern living.

306. *Scientific Interpretations of Physical Education.* I. 3 hr. PR: Doctoral standing. A synthesis of the behavioral and biological sciences as a foundation for advanced study in the disciplinary content of sport science and physical education.

320. *Individual Interaction in Sport and Physical Activity.* I, S. 3 hr. PR: Graduate standing or consent. Designed to acquaint the student with the reciprocal relation-

ships between sport and physical activity and the societies and cultures out of which sport emerges.

340. *Psychology of Sport and Physical Activity.* I, S. 3 hr. PR: Graduate standing or consent. Study of the psychological effects and implications of man's participation in sport and physical activity. Emphasis on psychological and learning theory, personality, and performance in physical activity.

345. *Group Influences in Sports.* I. 3 hr. PR: Research, Statistics, P.E. 320, 340. The content of this course is concentrated upon the manner and degree to which selected psychological processes of individuals are affected by involvement in sports.

360. *Biomechanical Analysis of Sport and Physical Activity.* II, S. 3 hr. PR: P.E. 164 and 165 or equiv., or consent. Advanced principles of body mechanics and analysis of muscle and joint actions in coordinated movement and neuromuscular physiology.

365. *Psychomotor Behavior Analysis.* II, S. 3 hr. PR: Doctoral standing. In-depth study of psychomotor learning with emphasis on behavioral change in physical activity. Review of research and psychological thought pertinent to motor learning personality, performance, and physical activity.

367. *Theories of Sport Physiology.* I, S. 3 hr. PR: Doctoral standing. Thorough and workable knowledge of principles involved in the interactions of muscles and nerves, reflexes, metabolism, cardiopulmonary function, environmental physiology, and the practical application of work physiology.

380. *History of Sport and Physical Activity.* II, S. 3 hr. PR: Graduate standing or consent. Anthropological and historical approach toward the influence of events, political and social climates, and personalities upon the sport cultures from early civilizations to the present.

Safety Studies

Saf. S.

70. *First Aid and Emergency Services.* I, II, S. 2 hr. Emergency aid for the sick and injured. Emergency services aimed at reducing the potential of permanent disability or threats to life, as well as pain, damage, or suffering of less serious nature. ($10.00 course fee.)

131. *Accident Prevention and Control Principles.* I, II, S. 2 hr. Basic course which structures principles, concepts, and methodology of the safety movement into introductory experiences dealing with accident prevention and control efforts recommended for various social institutions and agencies. ($10.00 course fee.)

231. *Safety in Motor Transportation Services.* I, S. 3 hr. PR: Saf. S. 300 or consent. Safety elements of automotive transportation equipment, design, operation, and control plus legislation and planning at federal, state, and local levels. The school motor fleet.

233. *Disaster Preparedness and Emergency Systems.* I, S. 3 hr. PR: Consent. Major elements involved in disasters and emergencies, preparedness planning, systems utilization, and attention to essential human services, with emphasis on community action.

251. *Driver and Highway Safety Fundamentals.* II, S. 3 hr. PR: Saf. S. 131. Basic course for individuals who plan to teach courses to beginning drivers which emphasizes essential content, methods, and desirable practices for both classroom and laboratory applications. ($20.00 course fee.)

254. *Teaching Driver and Highway Safety.* S. 3 hr. PR: Saf. S. 251 or equiv. and valid driver license. Major aspects of teaching and coordinating driver and highway safety education in the schools. Arranged laboratory assures practice in providing behind-the-wheel instruction to beginning drivers. ($20.00 course fee.)

255. *Current Safety Topics and Problems.* I, S. 3 hr. PR: Consent. Current and persistent problems in safety. Seminar emphasis extends attention to safety problems and issues of concern to participating class members.

300. *Philosophical Concepts in Safety.* I, S. 3 hr. Philosophies of the safety movement as expressed by leaders in the field are related to accident causation, accident prevention, and research implications.

310. *Environmental Aspects of Hazard Control.* I, S. 3 hr. PR: Saf. S. 300 or consent. Investigation of hazard control principles relating to environmental facilities and equipment including control procedures recommended by authorities from the fields of engineering, medicine, and public health as well as from the field of safety.

311. *Human Factors in Accident Prevention.* II, S. 3 hr. PR: Saf. S. 300 or consent. Investigation of concepts dealing with human behavior as related to accident experience in major reporting categories with consideration of psychological, sociological, and health implications.

336. *Occupational Safety Program Management.* II, S. 3 hr. PR: Saf.S. 300 or consent. Management guidelines, operational features and standards applicable to safety programs designed for business, governmental, educational, and industrial organizations.

337. *Personal and Environmental Safety Supervision.* II, S. 3 hr. PR: Saf.S. 300 or consent. Supervisory methods, tools, and techniques designed to develop safety leadership qualities, to promote human relations, and to motivate employee responsibility for safe living practices.

351. *Safety Education Principles and Content.* II, S. 3 hr. PR: Consent. Study and analysis of content areas usually recommended for instructional programs within the field of safety, with emphasis on structured learning experiences.

356. *School and College Safety Administration.* II, S. 3 hr. PR: Consent. Current emphasis on administering safety education, safety services, and environmental safety at various program levels from elementary school through college.

School of Social Work

The goal of the School of Social Work, which offers both an undergraduate program and a master's degree, is to educate a cadre of people who care about easing the burden of the poor in West Virginia and the Appalachian region. Such people are needed to work in the hollows, small towns, and cities of the region to help meet human needs.

There are opportunities for employment in West Virginia and the region in such areas as individual treatment, group experiences, and community organization with such agencies as child and public welfare departments, the courts, family counseling agencies, mental health programs, community action agencies, settlement houses, and with juvenile treatment centers.

The demand for bachelor's level social workers is great. They traditionally provide direct services to those who need them. There is a critical shortage of such qualified, well-trained human service personnel — people who care about human renewal and want to get involved.

The School of Social Work's undergraduate program is designed to provide students with a basic knowledge of social welfare as a system of social institutions that has been developed to meet human needs. Contemporary American social welfare programs are integrally related to our history and to current social and political changes. Social welfare services are of such significance that every educated citizen should have some knowledge of their origins, philosophy, and structure, as well as some understanding of the range of professional disciplines and skills utilized in carrying them out. This basic knowledge is offered in upper-division social work courses which have the following specific objectives:

1. To assist the student in understanding social welfare as a system of social institutions within the context of social change and shifting values in a democratic society.
2. To assist the student in developing a capacity for critical assessment of the significance of changes in social welfare policies and programs which affect human well-being.
3. To assist the student in the integration of other knowledge, drawn from academic studies and life experiences, into a personal philosophy regarding the rights and responsibilities of the individual in American society.
4. To assist the student in acquiring the basic knowledge and skills which are important for beginning social work practice.

The social work major is for students who are concerned about social issues, who wish an individualized, interdisciplinary course of study which is concerned with the development of human service skills and who wish to pursue careers in the human services.

The undergraduate social work major at WVU is approved by the Council on Social Work Education and is accepted, on completion of requirements for the bachelor of science degree, by the National Association of Social Workers for entry into regular membership in the association. The program prepares for social work practice at the beginning professional level.

Admission

Initial application to WVU should be submitted to the Office of Admissions and Records and should follow the same procedure as for all other University freshmen.

Students are enrolled in the College of Arts and Sciences for the freshman and sophomore years and during this time are advised by faculty at the Academic Advising Center.

Following completion of 58 hours of course work with an average of 2.0 or higher, and including the satisfactory completion of Social Work 51 with a grade of C or better, students are admitted to the social work major.

Social Work 51, which is taken during the sophomore year, is prerequisite to Social Work 200 and aims to provide an opportunity for the student to explore his or her interest and aptitude for a career in social work before electing the major in the junior year.

Other students, including transfers, who wish to enter the major should communicate directly with the Undergraduate Social Work Program in the semester before their intention to enter the program. Such students will be asked to submit a transcript of their academic record and provide additional material, which would serve to assist faculty in assessing interest and aptitude for social work prior to admission into the major. An interview with a faculty member is normally required. Should the assessment prove to be satisfactory, the student will be admitted into the major. In other instances, a student may be required to enroll in Social Work 51 before admittance to the major.

Complete information concerning WVU admission, registration, fees and expenses, regulations, etc. may be obtained in Part 2 or this *Catalog*.

Requirements for the Degree

A major in social work consists of a minimum of 24 upper-division hours in social work, and a minimum of 18 upper-division hours in social science courses selected from a group of courses designated by the undergraduate social work committee. A total of 128 hours are required for the degree; 58 of these hours must be in upper-division course work.

University Core Curriculum	*Hr.*
English Composition	6
Physical Education	2
Core Group A	12
Core Group B	12
Core Group C	12
	44
Social Work Courses	
Lower Division	3
Upper Division	24
	27
Recommended Upper-Division Courses	18
Electives	39
(At least 9-12 hr. of the electives will be utilized on the lower division for students to secure foundation content in the social science area beyond the Core Curriculum requirements.)	
Total	128

No foreign language is required. Students are urged to consult with their advisers regarding choice of electives.

To establish a major sequence and to qualify for graduation, the student must have spent at least two semesters and have accumulated a minimum of 30

semester hours as an upper-division student in the department of the student's major, or under its guidance.

The student who wishes to major in Social Work should contact the Social Work office in Allen Hall for assistance in planning and for additional information. Freshmen and sophomores who are considering social work as a major should consult the College of Arts and Sciences Academic Advising Center pre-social work advisers for help in planning their programs.

Social Work

S.W.

51. *Introduction to Social Work.* 3 hr. Introductory course to social work and the profession. The helper and the kinds of problems and situations with which the helper may become involved are explored. (Open to sophomores.)

200. *Social Welfare Policy and Services.* 3 hr. PR: S.W. 51 or consent. Institution of American social welfare. History, philosophy, objectives, and organization of social welfare policies and services in the United States.

210. *Social Welfare Policy and Services in Appalachia.* 3 hr. PR: S.W. 200 or consent. Organization of social welfare services in the state and region. Social, cultural, economic, and political factors influencing the current system.

220. *Social Work Methods I.* 3 hr. PR: S.W. 200 or consent. Theories and concepts of intervention, including prevention and rehabilitation with individuals, families, small groups, and communities. Students examine problem areas of concern to social work. Emphasis on beginning skills in interviewing, observing, recording, problem identification, and analysis. Field experience. (Open to social work majors only.)

221. *Field Experience in Social Work.* 3 hr. PR: S.W. 220 or consent. Development of basic helping skills through a supervised volunteer or work experience in a community agency or program. (Open to selected non-majors.)

222. *Social Work Methods II.* 3 hr. PR: S.W. 220. Helps students examine and analyze a variety of approaches to intervention, prevention, and rehabilitation. Current programs such as community action, model cities, comprehensive community mental health, organized population groups, services of departments of public welfare, extension, etc. Field experience.

280. *Seminar.* 1-6 hr. PR: Consent. Current issues in social work. Independent study with weekly seminar. Seminars in human sexuality, racism, and women's topics. Inquire at Social Work office for other current offerings.

381. *Field Instruction.* 5-14 hr. PR: S.W. 220, 222.

Part 4

INTERDEPARTMENTAL PROGRAMS

Committee on African Studies

Since 1967, the University has expanded its technical and academic competence regarding Africa from solely the agricultural sciences to include the social sciences and humanities. The Colleges of Arts and Sciences, Business and Economics, Human Resources and Education, and the Creative Arts Center, are involved in teaching and research in African and Africa-related subjects.

The Committee on African Studies was organized in 1969 to fulfill two basic requirements: (1) to blend the agricultural expertise of long standing with the newer programs of study and research into unified course offerings and systematic research; and (2) to make available knowledge in the social sciences and arts concerning Africa to existing and prospective University programs of African technical assistance.

Moreover, it is within the committee's mandate to broaden its activities to include other parts of the world experiencing problems of development and human change similar to those of Africa. Although University programs have been related primarily to East Africa, they have a wider application. The concepts and philosophy developed in all of these activities can be utilized throughout Africa and, with suitable modification, could benefit other developing areas of the world, including the Appalachian region.

Academic Goals of the Committee

Instructional Goals

The instructional goals of the committee are: (1) to provide an interdisciplinary competence in the teachings of the complex human and technological aspects of African development; and (2) to develop the procedural means for students in many fields readily to avail themselves of these interdisciplinary African and development studies.

Research Goals

The research goals of the committee are: (1) to provide interdisciplinary means through which contributions to the advancement of knowledge in African and development studies can be made by University faculty; and (2) to provide the opportunity for undergraduate and graduate students to pursue investigations, including field research.

The Africana Library Collection

The Africana collection contains more than 6,000 volumes, exclusive of periodicals, and is capable of supporting undergraduate and graduate research up to and including the doctoral level within several natural and social sciences.

Academic Programs of the Committee

Degree Programs

The committee does not offer undergraduate or graduate degrees in African studies as such, but rather stimulates the interdisciplinary study of Africa and development by students who are formally associated with departments in the natural and social sciences and humanities.

In 1970, the graduate public administration program was expanded to include an option in development administration. In effect, the offering of this option allies the Committee on African Studies and its curriculum with the Public Administration Program. Graduates completing the option are awarded the Master of Public Administration degree, with an interdisciplinary concentration in the area of African and development studies.

Special Academic Programs and International Study

The committee provides opportunities for special non-degree study in Africa-related subjects and is working to develop international study programs in Africa for University faculty and students.

African Speakers Program

For six years, the University has brought speakers on Africa to the campus. This program will be expanded by the Committee on African Studies.

Further information concerning the Committee on African Studies and its program can be obtained from:

Newton M. Baughman
Office of International Programs
212 Agricultural Sciences Building
Rodger Yeager
Department of Political Science
311 Woodburn Hall

Associated Faculty and Staff

O. J. Abbott, Ph.D. (U. Wisc.), *Professor of Animal Husbandry*
Vance Q. Alvis, Ph.D. (U. Va.), *Professor of Economics.*
Victor F. Amann, Ph.D. (U. Minn.), *Adjunct Associate Professor of Agricultural Economics* (presently in Africa.)
Gerald C. Anderson, Ph.D. (U. Mo.), *Professor of Animal Science.*
P. Vernon Armbrester, M.S. (WVU), *Assistant Professor of Agricultural Education and Assistant Campus Coordinator of International Programs.*
Wesley M. Bagby, Ph.D. (Columbia U.), *Professor of History.*
Newton M. Baughman, Ph.D. (Purdue U.), *Director of International Programs and Professor of Agronomy, Co-Chairperson of African Studies.*
Joy U. Berkley, M.A. (WVU), *Assistant Professor of English.*
Philip Bordinat, Ph.D. (U. Birmingham, England), *Professor of English.*
Thomas C. Campbell, Jr., Ph.D. (U. Pitt.), *Professor of Economics.*
Edmond B. Collins, M.S. (WVU), *Associate Professor of Agricultural Engineering.*
Robert Davis, M.A. (Ariz. St. U.), *Assistant Professor of Geography.*
Robert S. Dunbar, Jr., Ph.D. (Cornell U.), *Dean of the College of Agriculture and Forestry and Professor of Animal Science.*

Roy E. Emerson, M.S. (Cornell U.), *Associate Professor of Agricultural Engineering.*
Homer C. Evans, Ph.D. (U. Minn.), *Associate Director, Agricultural Experiment Station, and Professor of Agricultural Economics.*
Philip J. Faini, M.M. (WVU), *Associate Professor of Music.*
Mannon E. Gallegly, Ph.D. (U. Wisc.), *Professor of Plant Pathology.*
Harold A. Gibbard, Ph.D., (U. Mich.), *Professor of Sociology.*
Leon H. Ginsberg, Ph.D. (U. Okla.), *Professor and Dean of Social Work.*
Charles R. Grafton, M.S. (WVU), *Assistant Professor of Agricultural Engineering.*
Henry W. Hurlbutt, Ph.D. (U. Md.), *Associate Professor of Biology.*
Bruce M. John, M.S. (U. Ky.), *Charleston Area Director, Appalachian Center, and Assistant Professor of Sociology.*
A. D. Longhouse, Ph.D. (Cornell U.), *Professor and Chairperson of Agricultural Engineering.*
Marvin R. McClung, Ph.D. (Iowa St. U.), *Professor of Animal Science.*
Robert M. Maxon, Ph.D. (Syracuse U.), *Assistant Professor of History.*
Robert H. Maxwell, M.S., *Associate Professor of Agricultural Education.*
Paul G. Moe, Ph.D. (Rutgers U.), *Professor of Soil Microbiology.*
Robert F. Munn, Ph.D. (U. Mich.), *Director of Libraries, Chairperson and Professor of Library Science.*
Gaylen S. Myers, M.S. (WVU), *State Chairman, Community Resource Development, Appalachian Center.*
Ralph E. Nelson, Ph.D. (U. Minn.), *Professor of Agricultural Economics and Provost for Off-Campus Education.*
Ernest J. Nesius, Ph.D. (Iowa St. U.), *Benedum Professor of Agricultural Economics.*
Franklin Parker, Ed. D. (Geo. Peabody C.), *Benedum Professor of Education.*
Charles B. Sperow, Jr., M.S. (WVU), *Associate Professor of Agronomy.*
Willem A. van Eck, Ph.D. (Mich. St. U.), *Professor of Soil Science.*
James A. Welch, Ph.D. (U. Ill.), *Professor of Animal Science.*
Frank E. Woodson, D.V.M. (Ohio St. U.), *Associate Professor of Veterinary Science.*
Richard T. Wurster, Ph.D. (Cornell U.), *Associate Professor of Horticulture.*
Rodger D. Yeager, Ph.D. (Syracuse U.), *Associate Professor of Political Science and Co-Chairperson of African Studies.*

African and Related Undergraduate Courses of Study

College of Agriculture and Forestry

Agr. 190 — Man and Food

Faculty of Agricultural Biochemistry
Agr. Biochem. 320 — Special Topics

Division of Resource Management
Agr. Economics 213 — Economic Development
Agr. Education 320 — Special Topics

College of Arts and Sciences

Department of English
English 185 — Introduction to Contemporary African Literature
English 286 — Black American Fiction

Department of Foreign Languages
Swahili 1, 2 — Elementary Swahili
Swahili 3, 4 — Intermediate Swahili

Department of Geology and Geography
Geogr. 246 — Geography of Africa

Department of History
Hist. 229 — History of Africa: Pre-Colonial Africa
Hist. 230 — History of Africa: European Dominance and Independence
Hist. 251 and 252 — History of Black People in America to 1900 and Since 1900

Department of Political Science
Pol. Sci. 258 — Politics of Africa
Pol. Sci. 290 — Socio-Politics of Africa
Pol. Sci. 295 — Politics of Planned Development
Pol. Sci. 391 — Leadership and Authority in Africa
Pol. Sci. 394 — Theory of Political Development

Department of Sociology and Anthropology
S.A. 131 — Urban Sociology
S.A. 142 — Sociology of Economic Life
S.A. 156 — African Society and Culture
S.A. 190 — Man and Food (Same as Agr. 190)
S.A. 205 — Social Stratification
S.A. 223 — Sociology of Rural Life
S.A. 240 — Social Change
S.A. 241 — Population and Migrations
S.A. 251 — Cutural Dynamics
S.A. 253 — Cross-Cultural Studies in Development
S.A. 281 — African Society and Culture
S.A. 290 — Special Topics in Anthropology

Department of Speech Communication
Sp. Com. 175 — Rhetoric of the Black Movement

College of Business and Economics

Econ. 210 — Comparative Economics Systems
Econ. 213 — Economic Development (Same as Agr. Econ. 213)
Econ. 219 — Seminar in Economics
Econ. 375 — Economic Development
Econ. 379 — Seminar in Economic Development

Creative Arts Center

Division of Music
Music 230 — Music of Africa

College of Human Resources and Education

Division of Education
C&I 270 — Special Problems in Comparative Education

Center for Appalachian Studies and Development

The pioneers in the land-grant movement intended to establish institutions through which knowledge and learning would become an effective part of the daily lives of the American people. West Virginia University is such an institution.

The WVU Appalachian Center helps mobilize special efforts of private and public agencies; to extend and organize WVU resources to provide lifelong educational opportunities for more people; to assist young people through youth development programs to realize their potential; and to develop, gather, index, and disseminate knowledge.

The Center emphasizes the sharing of knowledge and providing insights about processes and systems of decisionmaking so that public and private leaders may make better-informed choices in individual, family, community, and government life. It recognizes the importance of planning programs centered on community, area, and statewide problems.

Field offices in each of the state's fifty-five counties and six area offices are integral parts of the Center and the University. These extension offices assist agencies and organizations in carrying out programs which support statewide development goals.

Division of Social and Economic Development

The Division of Social and Economic Development is responsible for research and educational programs which provide information to support higher educational activities intended to further the continuing improvement of social and economic activities in West Virginia. It has special responsibility, through its Office of Research and Development, for the design and conduct of applied interdisciplinary research projects which stimulate the development of new or modified University Extension programs, as well as providing research and evaluation of existing Extension programs relevant to the state's social and economic problems.

The Water Research Institute is included in the division. The Institute's program is designed to obtain knowledge needed to gain the greatest benefit from the water resources of West Virginia. The Institute is funded under the Federal Water Research Act of 1964.

Another program in the division is the Continuing Business Extension Program, which is offered with the College of Business and Economics. This program offers educational opportunities to the leaders of the state's smaller and medium-sized businesses.

Division of Manpower and Labor Studies

The educational and research activities of the Division of Manpower and Labor Studies are designed to meet the needs and interests of West Virginia's non-agricultural work force. Statewide programs of the division include non-credit short courses, conferences, seminars, and related research.

The division includes Fire Service Extension, Industrial Extension, Institute for Labor Studies, and Mining Extension.

Training for West Virginia's fire fighters is offered by Fire Service Extension. The fundamentals of fire suppression are taught in basic, advanced, and

regional schools conducted throughout the state. A training center located in Morgantown offers facilities for live fire-training and fire-extinguishment research.

Industrial Extension programs include the nationally recognized Underground Corrosion, Gas Measurement, and Gas Compression courses. These one-week schools bring several hundred industry technicians and engineers to the WVU campus each year.

Mining Extension provides workers an opportunity to acquire the specialized knowledge required of miners, mine mechanics, and mine supervisors. The curriculum includes courses in ventilation, gas detection, mining law, mining mathematics, safety and general mining practices, mine equipment maintenance, mine surveying, and coal preparation. The Mining and Industrial Extension programs are offered as cooperative efforts of the Appalachian Center and the School of Mines.

The Institute for Labor Studies conducts educational and research programs for workers and their organizations. Subject matter ranges from skill courses, such as steward training, collective bargaining, work measurement, union administration, job evaluation, and contract administration, to a liberal arts curriculum covering such subjects as labor and the economy, labor and government, labor and society, and labor history. Research ranges from collective bargaining studies, to attitude surveys, to economic analysis.

Division of Personal and Family Development

The goal of the Division of Personal and Family Development is optimum human development — the realization of self in society. Programs focus on ability and skill in decisionmaking, interpersonal relations, effectiveness of community participation, and development by the individual of a basic set of beliefs and values which give meaning to life.

The division's work is conducted through six program units: (1) 4-H Programs for Youth, (2) Extension Education Programs for Women, (3) Expanded Food and Nutrition Program that provides aides to work with low-income families, (4) Clergy Education, (5) Cultural Arts, and (6) Behavioral Studies.

Division of Community and Environmental Development

Educational programs of this division include community and rural development, environmental improvement and maintenance, outdoor recreation, tourism, housing, emergency preparedness, and agriculture and forestry extension.

Community and rural development focuses on improving the decisionmaking capabilities of both youth and adult community groups, organizations, agencies and public officials; improving community facilities and services; facilitating social and economic development; and identifying and effectively using resources.

Environmental improvement comprises educational programs designed to maintain an acceptable level of air quality, ample and clean water, and solid-waste management.

Outdoor recreation and tourism programs consist of nature study, field trips, recreational activities, recreational facilities and management, and creating an environment that will encourage tourist development.

Housing activities focus on the coordination of housing interests toward achieving a greater beneficial impact, providing information on current interests, and assisting groups and institutions to improve their delivery systems.

Emergency preparedness efforts concern educational programs designed to create awareness and knowhow in handling a variety of emergency situations involving natural or manmade disasters.

Opportunities exist for undergraduate and graduate students to support local program activities in a variety of subject-matter areas.

The agriculture and forestry extension programs, carried out in cooperation with the College of Agriculture and Forestry, have been in continuous operation in West Virginia since 1913. The primary objective is to collect, translate, and diffuse knowledge that has been generated by the College of Agriculture and Forestry and other similar institutions and organizations.

Programs concern agronomy, agricultural economics and farm management, agricultural engineering, forestry, horticulture, livestock, dairy, poultry, and plant pathology and entomology.

Division of Information and Education Technology

The Division of Information and Education Technology assists staff members of the Appalachian Center in developing and using teaching materials which utilize the advances that have been made in educational technology. The division also is involved with the preparation of subject matter and public affairs programming for radio, television, newspapers, and publications.

Division of Off-Campus Credit Programs

The Division of Off-Campus Credit Programs coordinates the WVU graduate and undergraduate off-campus course offerings and the Continuing Education Unit (CEU) Program.

Graduate Courses

Approximately 100 graduate-level courses are offered each semester at 30 different locations throughout the state. All courses (graduate and undergraduate) must be approved by the respective Department Chairperson, Academic Dean, and the Division Leader for Off-Campus Credit Programs. In addition, graduate-level courses must be approved by the Graduate School Dean. Students taking off-campus courses for credit must satisfy all requirements for admission to the University and, before registering, must file with the WVU Dean of Admissions and Records complete official transcripts of record. A fee of $14.00 per semester hour and a $20.00 off-campus enrollment fee are charged for each off-campus, graduate-level course offered.

It is the responsibility of students to ascertain from the appropriate college and department specific requirements established to earn a degree. This not only includes the specific classes but work that needs to be done in residence study on the Morgantown campuses.

Undergraduate Courses

West Virginia University operates an off-campus undergraduate center at Greenbrier East High School at Fairlea, Greenbrier County. Generally, students may earn enough credit to satisfy freshman requirements. Selected courses also are offered at the Alderson Reformatory for Women, the Kennedy Youth Center, and where expressed needs cannot be met by local colleges.

A fee of $12.00 per semester hour and a $12.00 off-campus enrollment fee are charged for each off-campus undergraduate course offered.

Library Resources

Library and laboratory facilities for off-campus courses must be approved by the Division Leader for Off-Campus Programs and, in case of courses for graduate credit, by the Graduate School Dean. Books for use by off-campus students may be borrowed from the WVU Library upon the order of the Division Leader for Off-Campus Credit Programs, subject to the approval of the Library Committee. Postal charges must be paid by the individual or groups for whom the books are borrowed.

Continuing Education Unit Program

Recognizing the importance of continuing education, WVU has adopted the Uniform Measurement System recommended by the national task force coordinated by the National University Education Association. The Continuing Education Unit (CEU) may be used for the measurement, recording, accumulation, transfer, and recognition of participation by adults in programs which seldom in the past have been recorded in a systematic way or with any sense of permanence, significance, or transferability. The unit can be applied with equal facility to professional continuing education, vocational retraining, and adult liberal education, as well as all other programs in adult and continuing education. The assignment of CE Units to a WVU-sponsored educational activity is the responsibility of the Division Leader for Off-Campus Credit Programs.

For further information, write to the Division Leader for Off-Campus Credit Programs, 204 Coliseum, West Virginia University, Evansdale Campus, Morgantown, WV 26506.

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West Virginia University cultural attractions encompass all the arts — ranging from internationally recognized artists to the expertly done productions of the Creative Arts Center. Semester and weekly calendars of WVU events carry listings of exhibits, lectures, plays, concerts, operas, film classics, and other cultural events.

1974-75 Undergraduate Catalog
West Virginia University
Office of Admissions and Records
Morgantown, WV 26506

Second-Class Postage Paid at
Morgantown, WV 26506

(Entered at Morgantown, WV
as second class matter
under Act of Aug 24, 1912)

The state university is the one institution in which all citizens of the state, except those wealthy enough to send their children elsewhere, have a direct or potential interest.

—*York Willbern, Indiana University Political Scientist*